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AUTHOR Littlefield, William N.
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ABSTRACT

The study described in this report employed the Caffrey and Isaacs model to assess the economic impact of the Long Beach Community College District on the local community. Following a summary of research findings, the report reviews the Caffrey and Isaacs model and two additional economic impact studies. Next, the report considers the relationship between producing and consuming entities using a circular flow diagram and looks at sources of district funding and faculty/staff residence patterns. Figures are then presented showing the primary impact (i.e., immediate consequences of college expenditures on personal income, retail sales, and employment) and induced impact (i.e., increases stimulated by the primary impact) of the college. Next, the effect of the school on local banks' credit base is assessed. After impact results using the Caffrey and Isaacs model are presented, the indirect impact of a community college education is measured in terms of the increased productivity of students, local personal incomes, retail sales, and employment. Discussions of the impact of the District on other local government units and on the reduction of poverty and unemployment conclude the report. Data tables showing income and sales ratios, estimates of the value of community college education for Long Beach and other urban California areas, and comparisons with data from a statewide impact study of Illinois community colleges are included in the appendices. (HB)

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THE ECONOMIC IMPACT OF THE LONG BEACH COMMUNITY COLLEGE DISTRICT FISCAL 1981

William N. Littlefield
Professor of Economics
Long Beach City College
4901 E. Carson Street
Long Beach, California

December 14, 1982

JC 830 156

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PREFACE

The objective of this study was to identify and measure the economic impact of Long Beach Community College District (LBCCD) on the local community, using a model developed by John Caffrey and Herbert H. Issacs for the American Council on Education.

However, it soon became evident that Caffrey and Issacs could be used as a starting point only. The complexity of LBCCD and institutional changes since the publication of Caffrey and Issacs rendered it impossible to lift a few equations and plug in a few numbers. One of the first issues adding to the complexity involved the origin of LBCCD's funds. The economic impact depends on whether LBCCD brings new money to the community or simply recycles money already in the community. This issue is addressed in the section dealing with funding.

In the process of discussing the project and some approximations of the results (with Dr. John T. McCuen, superintendent-president of LBCCD), it occurred to me that there could be a second objective of this study. At a time when higher education in general, and community colleges in particular, must compete for funding with other more politically sensitive programs, the results might prove to be helpful in obtaining funding from the legislature.

Two different audiences would appear to be interested in two separate but related issues.

> What is the economic impact of Long Beach Community College, the institution, on the local community?
>
> What is the economic impact of community college education, the product, on the local community?

The conclusion drawn from this study is that the second question is vastly more important to the local community than the first. The most significant economic impact of LBCCD would not appear to arise from the flow of funds through the District but rather originates from the impact of community college education on the productivity of the local work force. It is the emphasis on the economic impact of the educational process which sets this study apart from similar studies of community colleges.

Using the Caffrey and Issacs model as a starting point, I have attempted to quantify the economic impact of LBCCD, the institution. However, I have also attempted to quantify the economic value of community college education to the local community.

Ultimately, the economic impact of the LBCCD will be a composite of many factors rolled into a single number. And that number is the result of many assumptions. As a consequence, it would be wise to remember the caveat inherent in the paraphrasing of Humpty Dumpty's words to Alice:

When I use a number, it means just what I
choose for it to mean--neither more nor less.

I have attempted to avoid implicit assumptions and to keep my methodology in the open. I believe the assessment of the economic impact of LBCCD to be fair, if not conservative. Each reader may judge for himself/herself.

DEFINITION OF LOCAL COMMUNITY

When used in the context of a geographic area, the terms District and local community refer to the area included within the boundaries of the Long Beach Community College District, excluding Catalina Island. The District is located in the southeast part of Los Angeles County. Within its boundaries are found the cities of Long Beach, Signal Hill and a part of Lakewood. Long Beach is the second largest city in Los Angeles County and accounts for approximately 80 percent of the District's estimated 430,000 population.*

TIME FRAME

In order to arrive at a single number which will summarize the economic impact of LBCCD, all data is either for the 1980/81 fiscal year of the College or is adjusted to that year. All references to 1981 should be interpreted as Fiscal 1981.

William N. Littlefield
December 14, 1982

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* Population at January 1, 1981 as reported in State of California, California Statistical Abstract: 1980, Table B-6

A SUMMARY OF THE ECONOMIC IMPACT OF THE LONG BEACH COMMUNITY COLLEGE DISTRICT ON THE LOCAL COMMUNITY, FISCAL 1981

William N. Littlefield
Professor of Economics

The Long Beach Community College District (LBCCD) has a substantial positive economic impact on the local economy. During Fiscal 1981, LBCCD was estimated to be directly or indirectly responsible for the employment of more than 3400 persons, adding $90 million to personal income of the local economy. Retail sales generated by this personal income were estimated to be over $43 million. The first round of retail sales alone support over 40 retail establishments.

The local economy includes the area within the boundaries of the Long Beach Community College District. Located in the southeastern portion of Los Angeles County, it includes the cities of Long Beach, Signal Hill and the southerly eighty percent of Lakewood. Avalon was excluded from the analysis because of its geographic isolation from the rest of the District.

For analytical purposes, the economic impact of LBCCD was divided into two parts, direct and indirect. The direct impact is the consequence of the day-to-day operation of the College. It is measured in terms of the annual flow of funds through the College. The indirect impact is the consequence of the educational opportunities which the College provides the local community. It is measured in terms of an educational income increment.

Each impact is defined in terms of a specific question. The direct impact seeks to answer the question:

> "What is the economic impact of LBCCD, the institution, on the local economy?"

The indirect impact seeks to evaluate:

> "What is the economic impact of community college education, the product, on the local economy?"

THE DIRECT IMPACT OF THE COLLEGE

The magnitude of the direct impact is primarily dependent upon two factors: (1) the origin of College funding and (2) the percentage of College faculty and staff residing in the local economy.

The maximum positive impact occurs when two conditions are met: (1) the College is entirely funded by new money brought into the local community (e.g., tuition from non-local students) and (2) the entire faculty and staff reside in the local community. At the opposite extreme, the College would have a substantial negative direct impact on the local economy if (1) it is funded by local residents (e.g., property taxes or fees) and (2) its employees reside entirely outside the local community. In the latter case, the College might be envisioned as a giant exhaust fan sucking funds from the local economy and depositing them in the next county.

LBCCD funding is derived largely from sources outside the local economy. During Fiscal 1981 only eight percent of the total College budget was derived locally. With heavy reliance on State apportionments and Federal funds, the College brings money to the community that would not be there in its absence. An additional $7 million is brought into the local economy in the form of student financial aid, such as veteran's and social security benefits.

Approximately 60 percent of the College faculty and staff reside within the District. As a consequence, the College is directly responsible for the addition of over $21 million to local personal incomes. This income leads in turn to a series of subsequent impacts:

- Retail sales are increased by over $12 million;
- Over 40 retail establishments are supported from these retail sales; and
- The $12 million retail sales generate further secondary direct impacts within the local economy including:
  - employment for over 310 additional people;
  - over $8 million in additional personal income;
  - over $3 million in additional retail sales.
- The demand for 35 local dwelling units with an estimated annual rental value of $150,000.

When compared to the $2.6 million raised locally by the College, the following ratios emerge:

- The ratio of personal income generated by the College to funds raised locally is over 11 to 1.
- The ratio of retail sales generated to funds raised locally is 6 to 1.

IMPACT ON THE LOCAL CREDIT BASE

The impact on the local credit base was not evaluated because LBCCD has little, if any, impact. There are two reasons for this. First, the local banking system is dominated by statewide branch banking. Second, LBCCD deposits its funds with the Los Angeles County Treasurer, not the local banking system.

IMPACT ON OTHER LOCAL GOVERNMENTS

Evaluation of the impact of LBCCD on other local governments included the City of Long Beach, the City of Lakewood, and the Long Beach Unified School District (LBUSD). The impact on Lakewood was positive, an estimated $80,000 from increased sales tax collections. Evaluation of the impact on both Long Beach and LBUSD sought to identify and measure reciprocated costs and benefits, to determine the net impact. To the extent these could be identified and measured, the impact on Long Beach and LBUSD is neutral.

The College received an estimated $478,000 in public safety services from the City of Long Beach. The College paid regular commercial rates for gas and water supplied by the City. The City collected an estimated $403,000 in sales tax and other revenues as a result of the presence of the College. The resulting net loss of $75,000 to the City was partly mitigated by a $37,000 net reduction in College property tax revenues resulting from tax exempt City property. The balance of $38,000 would be offset as long as at least 19 full-time LBCCD students (or their dependents) were City employees. While there is no practical way to determine the value of educational services which the College provides City employees and their families, a $38,000 estimate would seem conservative.

The net impact on LBUSD was difficult to quantify. It consists of two elements: (1) the net loss of property tax revenues resulting from the tax exempt property held by each district, and (2) the net cost of students originating from employees of each district. First, without a comparable estimate of the fair market value of LBUSD facilities, there was no way to measure the net loss of property tax revenue. With over eight times as much land and over thirty times as many sites, LBUSD would intuitively appear to impose a net burden on LBCCD. Second, LBCCD faculty and staff were responsible for an estimated 175 students enrolled in LBUSD. The net local cost of these students is small given the heavy reliance on State apportionments to fund LBUSD. However, there was no practical way to evaluate the educational services which LBCCD provides for LBUSD employees and their families. As a consequence the net impact could not be precisely estimated.

THE INDIRECT IMPACT

The indirect impact evaluates the impact of the community college educational process on the local economy. Unlike the direct impact which can be attributed to LBCCD with a high degree of certainty, the indirect impact is the consequence of community college education, the product, but not necessarily LBCCD.

The indirect impact was estimated by identifying an educational income increment (EII). EII is the difference between the income of a high school graduate and a person with one to three years of college. EII measures the value of the productivity increment attributable to one to three years of college education.

Using 1970 Census data for the Los Angeles-Long Beach SMSA adjusted for inflation, the EII for Fiscal 1981 was estimated to be $2850 per person.

The educational income increment attributable to community college level education adds over $59 million to local personal incomes and generates over $27.5 million in local retail sales. The increase in retail trade is responsible for the creation of more than 550 local jobs.

Inclusion of the indirect impact in the economic impact of LBCCD rests on the assumption that the level of community college education in the local economy is like water impounded by a reservior. LBCCD is like a river maintaining the level of the reservior. With relative stability in Average Daily Attendance (ADA-16,000) and population in the District, it is assumed that LBCCD maintains the number of persons with one to three years of college education at the level of the 1970 Census. This assumption errors on the conservative side since it excludes four-year college graduates who received their first two years of college at LBCCD but who are included in the Census data as four-year college graduates.

UNEMPLOYMENT AND POVERTY

The investment in human capital which increases productivity not only increases incomes as measured by EII but also makes it possible for more people to work at prevailing wage rates. While the impact of increased income is included in the indirect impact, the complementary effects of reduced unemployment and reduction in the number of poverty level families are not. Based on Census data, the importance of community college level education is underscored by two additional findings:

- 95 percent of the unemployed high school graduates would be employed if they complete one to three years of college; and
- 95 percent of the high school graduates living below the poverty level would be elevated above that level by one to three years of college.

If community college education could eliminate poverty among local high school graduates, the saving in public assistance within the City of Long Beach would amount to over $1.6 million per year. In addition, the importance of reducing unemployment is underscored by the results of studies conducted by Professor M. Harvey Brenner cited in "Business Week," March 29, 1982:

> "When unemployment rises by 1 percent, state prison populations rise by 4 percent, murders increase by 5.7 percent, mental hospital admissions rise by 2 percent to 4 percent, and suicides increase by 4 percent." (page 166)

NOTE: The underlying study of which this is a summary contains both the data and methodology used to reach the conclusions stated above. The reader will also find a discussion of the theoretical and philosophical basis for the study.

SUMMARY OF THE ECONOMIC IMPACT OF THE
LONG BEACH COMMUNITY COLLEGE DISTRICT
FISCAL 1981

TABLE S.1
EMPLOYMENT

	JOBS	
	Part-Time	Full-Time
Long Beach Community College District	1770	766
Retail Trade		155
Multiplier Effect		155
Long Beach Unified School District		12
Total Direct Impact	1770	1088
Educational Income Increment		
Retail Trade		276
Multiplier Effect		276
Total Indirect Impact		552
Total Both Impacts	1770	1640

TABLE S.2
PERSONAL INCOME

ORIGIN OF PERSONAL INCOME	IMPACT	
	Direct	Indirect
College Payroll and Financial Aid	$ 21,018,690	
Educational Income Increment		$ 45,600,000
First Round Retail Sales	4,250,150	7,024,200
Multiplier, First Round Retail Sales	3,944,750	7,024,200
Total	$ 29,213,590	$ 59,648,000

NOTE: Excludes personal incomes generated by expenditures from educational income increment and personal income of faculty/staff/students for non-retail services.

TABLE S.3
RETAIL SALES

ORIGIN OF RETAIL SALES	IMPACT	
	Direct	Indirect
College Payroll and Financial Aid	$ 12,273,082	
Educational Income Increment		$ 21,900,000
First Round Retail Sales	1,700,060	2,809,680
Multiplier, First Round Retail Sales	1,577,900	2,809,680
Total	$ 15,551,042	$ 27,519,360

TABLE S.4
NUMBER OF RETAIL ESTABLISHMENTS SUPPORTED
FIRST ROUND RETAIL SALES

Retail Establishments, Direct Impact	14.5
Retail Establishments, Indirect Impact	26.0
Total	40.5

REVIEW OF SELECTED LITERATURE

At the outset of this study, three existing pieces of literature devoted to economic impacts of a college were read and evaluated. These were:

(1) John Caffrey and Herbert H. Issacs, "Estimating the Impact of a College or University on the Local Economy," American Council on Education. Washington, D.C., 1971.

(2) James A. Phillips, "Economic Impact of Community Colleges on Local Economies," Cypress College, undated.

(3) Illinois Community College Board, "A Study of the Economic Impact of Six Community Colleges in Illinois," March 1980.

In this section each of the above will be briefly described and evaluated. Page numbers in parenthesis after identification of a study refer to a page in that study.

CAFFREY AND ISSACS

The Caffrey and Issacs models represent the starting point for this point for this and similar studies of the economic impact of a college. Developed in 1971 as a guide to assist colleges and universities in determining their economic impact on the local community, Caffrey and Issacs-type studies have become more numerous in recent years as public institutions of higher education seek to retain their funding sources. The historic emphasis on the long-run benefits of higher education has gradually been submerged beneath a growing emphasis on its short-run costs.

In the Foreword to "Estimating the Impact of a College or University on the Local Economy," Logan Wilson, President of the American Council on Education writes:

> "The purpose of this publication is to provide a better basis for understanding one set of relationships between the campus and the surrounding community. It constitutes a common-sense guide for persons interested in finding out whether it costs a community more or less than it gains economically by having a college or university in its midst." (page ix)

The stated purpose is only partly carried out because the models include only expenditures, not revenue. Caffrey and Issacs explain this exclusion because "amounts and sources of revenue are already known." Nonetheless, as pointed out previously, the source of funding is important to the economic impact of a college.

The expenditures associated with the presence of a college are represented by three sets of equations, each representing a different type of impact. The first set of equations is concerned with the impact on local business volume. The detail of this model is reflected in the following list of equations:

College-Related Local Business Volume (B-1)
College-Related Local Expenditures (B-1.1)
Local Expenditure by College (B-1.1.1)
Local Expenditure by Faculty/Staff (B-1.1.2)
For Local Rental Housing (B-1.1.2.1)
For Local Nonhousing by Local Faculty/Staff (B-1.1.2.2)
For Local Nonhousing by Nonlocal Faculty/Staff (B-1.1.2.3)
Local Expenditure by Students (B-1.1.3)
Miscellaneous excluding Room and Board (B-1.1.3.1)
For local rental housing (B-1.1.3.2)
Nonhousing by students who rent (B-1.1.3.3)
By Nonlocal students (B-1.1.3.4)
By Local Living Groups (B-1.1.3.5)
Local Expenditure by Visitors (B-1.1.4)

Purchases from Local Sources by Local Businesses in Support of their College-Related Business Volume (B-1.2)
Local Business Volume Stimulated by Expenditure of College-Related Income by Local Individuals Other Than Faculty/Staff/Students (B-1.3)
Value of Local Business Property Committed to College-Related Business, detail omitted herein, (B-2)
Expansion of Local Banks' Credit Base Resulting from College-Related Deposits (B-3)
Local Business Volume Unrealized because of the Existence of College Enterprises (B-4)

The second set of equations deals with the impact on local government. For brevity only the major model and submodel are listed here.

College-Related Revenues Received by Local Governments (G-1)
College-Related Real-Estate Taxes Paid to Local Governments (G-1.1)
College-Related Property-Taxes Paid other than Real-Estate Taxes Paid to Local Government (G-1.2)
Sales Tax Revenue Received by Local Government as a Result of College-Related Local Purchases (G-1.3)
State Aid to Local Governments Allocable to the Presence of the College (G-1.4)
Other College-Related Revenues Collected by Local Governments (G-1.5)
Operating Cost of Local Government-Provided Municipal and Public School Services Allocable to College-Related Influences (G-2)
Value of Local Governments' Properties Allocable to College-Related Portion of Services Provided (G-3)
Real-Estates Taxes Forgone through the Tax Exempt Status of the College (G-4)
Value of Municipal-Type Services Self-Provided by the College (G-5)

The third set of equations measures the economic impact on local individuals:

Number of Local Jobs Attributable to Presence of College (I-1)
Personal Income of Local Individuals from College-Related Jobs and Business Activity (I-2)
Durable Goods Procured with Income from College-Related Jobs and Business Activity (I-3)

The beauty of these equations is their relative computational simplicity and the availability of most of the data within the college itself.

The economic impact of LBCCD using some of the above equations is presented in a later section of this study.

Caffrey and Issacs used their model to estimate the economic impact of the Claremont Colleges (California). The decision to focus on expenditure and ignore revenue does not adversely affect the evaluation of economic impact in the Claremont setting. The Colleges are all private institutions which cater to a student population originating almost entirely from outside the local economy. As a consequence, the Claremont Colleges are an almost classic example of an export industry. New money flows into the local economy and a product, educational services, flows out, since very few students remain in the Claremont vicinity after graduation. The consideration of the origin of the money is unimportant since expenditures of the Colleges represent a positive stimulus for the local economy.

Previous studies which follow in the footsteps of Caffrey and Issacs appear to be deficient in another aspect. Unlike Claremont where students graduate and leave the local community, an urban community college serves a more or less permanent population. As a consequence, the local community derives a stream of economic benefits from the increased productivity attributable to college education. As a subsequent section will suggest, these indirect benefits are far more important to the local community than the benefits which emerge from a Caffrey and Issacs-type study.

PHILLIPS

Phillips seeks to apply the Caffrey and Issacs models to the economic impact of Cypress College (North Orange County Community College District, California) for the year 1974. Cypress is located in Orange County approximately seven miles east of Long Beach City College.

Phillips' results (page 7) which are relevant to the current study include:

1. $11.2 million net positive impact on local business;
2. $2.4 million impact on local banks' credit base;
4. 1,008 jobs generated by college operation;
5. $8.3 million personal income generated by college operation;
7. $1.7 million in local government revenues generated by college presence (including tax revenues and state aid);

8. $6.6 million in local government operating costs attributable to college presence, with $103 million of local government properties devoted to these services;
9. $150,000 in property taxes forgone to local governments; and
10. $297,000 in services provided by the college to local governments.

Unfortunately, the Caffrey and Issacs equations are not presented in the Cypress study. And in the absence of more specific data to plug into these equations, the above must be viewed as conclusions which cannot be evaluated except on the surface.

The significance of the $11.2 million net positive impact on local business assumes the College is a stimulant to the local economy. Since the study was conducted before the passage of Proposition 13, the College derived at least half of its revenues from local property taxes. As described in the previous section, reliance on local funding substantially reduces or eliminates the positive impacts of the College. If the College is taking funds from some local pockets and distributing them to others which may or may not be within the local economy, the net impact on the local economy could be zero or negative. The jobs created because of expenditure by the College could have been created just as easily by local residents spending their income on goods and services instead of paying taxes to the College. The College becomes a vehicle for recycling money already in the community, and the claimed positive impact is questionable.

Any impact analysis must consider the origin of funding to insure that the benefits claimed are not offset by similar reductions in benefits derived by members of the local tax paying community.

The $6.6 million in benefits which local governments provide for the college seem excessive, with detail absent from the study, it is impossible to determine the composition of this seemingly obese negative impact.

Did the $297,000 in benefits which the college provided the community include the value of educating those who were employees and dependents of the local governments which provided the benefits to the College? It would appear unreasonable on the surface to burden the College with all the costs of other governments without offsetting these by all of the costs which those governments impose on the College.

A similar question is posed by the $150,000 in property taxes forgone by local governments as a consequence of the tax exempt status of the College. What is the impact on the College of the tax exempt status of other local government properties?

In the judgement of the author of the current study, the economic impact of a college must be viewed in terms of a net impact. The benefits of the presence of a college will tend to be understated, perhaps significantly so, if the costs imposed on other local governments are included but the benefits provided by the college in the form of educational services for employees and dependents of those governmental entities are excluded. Further, the origin of funding is crucial to the net aggregate impact of the college on the local community. Phillips evaluation of his results states "Cypress College benefited local individuals via increased incomes, potential bank loans, and employment generated." Would these claims be valid if the net economic impact were evaluated?

ILLINOIS STUDY

The Illinois study, covering the year ended June 30, 1978, is interesting, because it compares a group of six community colleges with widely divergent characteristics: urban and rural; large and small; high and low expenditure. Within the group of six colleges, the positive impact on local business volume ranged from $2.76 to $3.85 per dollar spent by the college (page 16). The differences were attributed to the "characteristics of faculty, students, and financial expenditures of the college." Unfortunately, the characteristics of the individual colleges were neither identified nor their significance explored further.

Although the study is rooted in Caffrey and Issacs methodology, it correctly observes that "a community college does not fit all parts of the Caffrey-Issacs model, because certain financial aspects are different from four year colleges." (page ii). The differences are met by deleting five of the twelve Caffrey-Issacs models from the study.

Like the Phillips study, the Illinois study appears to evaluate costs imposed upon other local governments. There is nothing which suggests that the benefits provided by the colleges are included to mitigate the costs which the colleges impose on local governments.

The issue of funding sources is not dealt with in the Illinois study. However, the importance of local funding is suggested by a comparison of two ratios developed in the study (page 16). The first is the ratio of local business volume to local revenue raised by the college. For the six colleges the range was 4.28 to 14.43. The second is the ratio of local revenue to total revenue. The range was .66 to .25. The college with the highest ratio of local business volume to local revenue (14.43) was also the college with the lowest ratio of local revenue to total revenue (.25). At the opposite extreme, the college with the lowest ratio of business volume to local revenue had a ratio of local revenue to total revenue of .61.

Based on the impact of these six colleges, the study seeks to extend the results to the statewide level. Such extensions can be misleading. What is true of an individual college does not necessarily need to be true for community colleges as a group. This point may be illustrated by reference to the circular flow diagram in the previous section. When funding comes from outside the local economy, there is a greater positive impact than when funding comes from within the local economy. As suggested in the previous paragraph, as the funding becomes more local in origin, the positive impact on the local economy diminishes. When the level of analysis is extended to the statewide level, the "local" economy becomes the state. When consolidated on the statewide level, the positive impact must be netted out against the negative impact of income reductions by the taxpayers of the state.

SOURCES OF FUNDING

INTRODUCTION

The economic impact of a college depends on its revenue sources, the residency of its faculty/staff and the economic stature of the local economy. The latter will not be addressed herein except to note that LBCCD is located in one of the strongest, largest and most diverse regional economies in the United States. As a consequence the maximum impact originating from this factor is assumed.

Before addressing the topics of funding sources and faculty/staff residence, a brief digression on the nature of a circular flow diagram will permit development of a useful analytical tool to understand the importance of funding sources, faculty residence, and permit an evaluation of selected literature.

The simplist circular flow diagram shows the relationship between producing and consuming entities. It rests on the assumption that the consuming units are totally dependent on the producing entities for the goods and services which the consuming units acquire and use. It further assumes that resources used to create those goods and services are all owned by the consuming units. Four flows emerge:

A. Real flows

1. Resources flow from the consuming units to the producing units;
2. Goods and services flow from the producing units to the consuming units;

B. Money flows

3. The flow of money from the producing units to consuming units as producers acquire the use of resources from consumers;
4. The flow of money from the consuming units to the producing units as consumers acquire goods and services from the producing units.

These flows are depicted in Diagram I at the top of the next page. The diagram represents a closed system which is completely self-contained. There is no way to increase or decrease the amount of money in the system. Neither resources nor goods and services can be exported or imported.

DIAGRAM I
CIRCULAR FLOW DIAGRAM

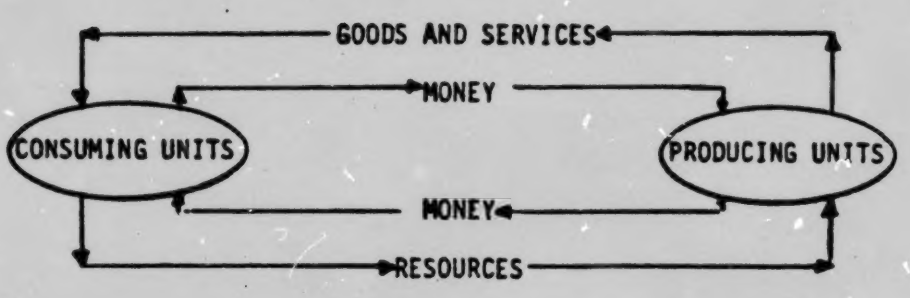


Diagram I depicts the basic exchange which occurs within the economic system. Goods and services are exchanged for resources. Money acts as a medium of exchange to facilitate this basic exchange. The money flowing around the inner loop of the diagram is analogous to oil in an automobile engine. It is recycled and primarily helps to eliminate or reduce friction in basic exchange.

A college may be viewed as a producing entity creating a service called education. The production of this service requires the use of resources. In order to transfer a part of the community's resources to the college, the college must obtain money from somewhere.

SOURCE OF FUNDS: CLOSED SYSTEM

Within the context of the circular flow diagram developed above, the simplist case would be for the College to sell its service directly to those consuming units willing and able to pay for educational services (e.g., impose fees or charge tuition). Although the internal composition would be different, the aggregate value of goods and services within the local economy would be essentially the same. The college would use the funds received from the sale of educational services to acquire the resources with which to provide more educational services. The resources acquired by the college are not available to produce other goods or services. The local community pays for educational services not just in money but also through the sacrifice of other goods and services. There is thus both a real as well as a money cost for educational services.

A similar situation exists if the college obtains money by means of taxation (e.g., property taxes). The only difference between taxation and fees (or tuition) is who pays. In the case of tuition or fees, those who benefit directly pay. They bear both the real and money burden. In the base of taxation, virtually every consuming unit in the local economy pays either directly or indirectly. Those who receive the benefits of the educational process bear only a small part of the real and money costs. The merits of this difference in funding are ethical and social and therefore beyond the scope of this study. Since the economic impact of taxes and fees on the local economy is the same, they will be treated as a unit in this study.

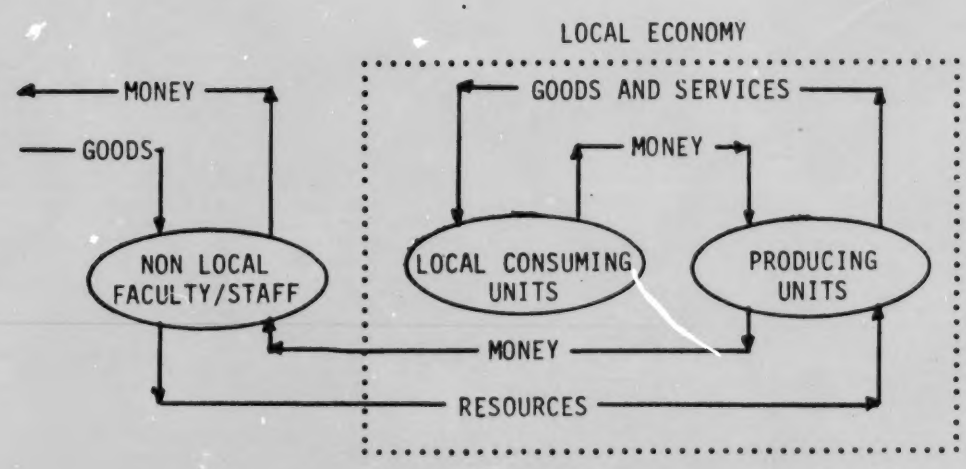
In a closed system the faculty and staff of the college must reside in the local economy. As a consequence all of the money spent by the college to acquire resources remains in the local economy and is used to acquire goods and services produced within the local economy. The first relaxation of the closed system assumptions will be to explore what happens when the faculty/staff live outside the local economy.

Initially assume the most extreme case in which the faculty and staff live entirely outside the local economy. The college would be analogous to a giant vacuum sucking money from the consuming units in the local economy and depositing it with consuming units in another local economy. Essentially, the college is importing resources to provide a service funded locally (i.e., property taxes and/or fees). The situation is similar to importing oil from O.P.E.C. and is analogous to an adverse balance of trade or a trade deficit. The immediate consequence of an outflow of money from the local economy is a reduction in the ability of local consuming units to acquire the goods and services created by the local producing units. Unemployment among local resources is an immediate problem which could be subject to a multiplier effect unless mitigated. This situation is depicted in Diagram II with the limits of the local economy delineated by the dotted boundary.

Fortunately, the world is more complex. Once the barrier of the closed system has been broken, mitigating forces may be introduced. For example, the resources which may be idled in the situation above can find employment in the neighboring local economy. The adverse balance of trade is thus corrected in whole or in part.

Nonetheless, there is a minimal positive impact or a negative impact on the local economy when educational services are paid for locally and the faculty/staff reside outside the local economy.

DIAGRAM II
CIRCULAR FLOW DIAGRAM, NONRESIDENT FACULTY



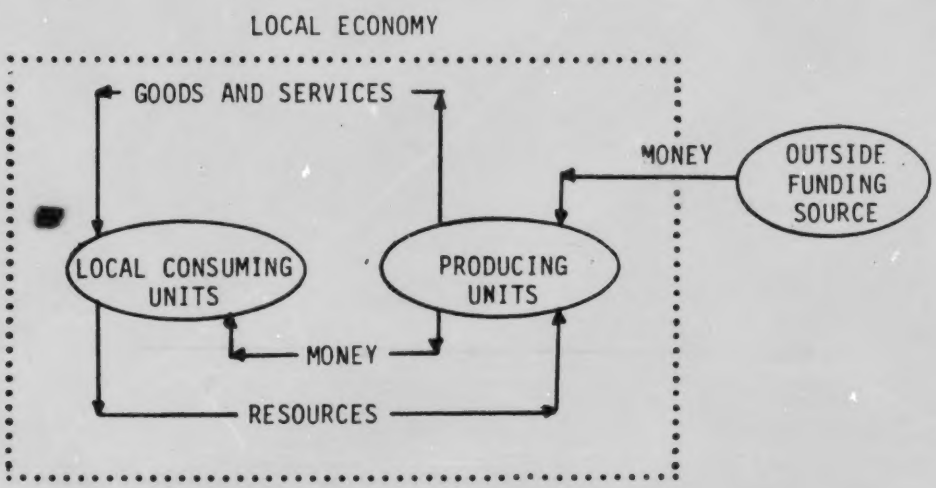
SOURCE OF FUNDS: EXTERNAL

An alternative method to mitigate the problem of a non-resident faculty/staff would be for the college to be funded externally. In terms of money flows, the college thus becomes analogous to an export industry. The money flowing into the local economy is essentially new money. Although the origin of new money will differ from college to college, new money comes into the local economy from either of two sources. First, most California community colleges receive 85-90 percent of their funding from either the State of California or Federal grants-in-aid. In the case of a private college (or an out-of-state student at the California public institution), room, board and tuition payments are new money flowing into the local economy.

The immediate consequence of the new money flowing into the local economy is the employment of resources by the college. The money flow to consuming units increases (i.e., their incomes increase). As a consequence of increased incomes, the consuming units purchase more of the goods and services created by non-college producing units. The creation of additional goods and services requires the employment of more resources. This in turn leads to a second round of higher incomes and resulting increased demand for funding continues around the circular flow diagram until there has been a multiple increase in income and sales. (Note: By implication, the system is assumed to be closed except for the infusion of new money.)

Diagram III assumes that the entire faculty and staff of the college reside in the local economy. The infusion of new money will touch off a multiple expansion of jobs, incomes and sales. The combination of external funding and a resident faculty/staff creates the environment in which the maximum positive impact on the local economy will occur.

DIAGRAM III
CIRCULAR FLOW DIAGRAM, OUTSIDE FUNDING SOURCE



IMPACT OF PROPOSITION 13

The economic impact of LBCCD on the local economy shifted dramatically with the passage of Proposition 13. Until Prop. 13, LBCCD derived about two-thirds of its income from local sources. With about half the faculty and a third of the staff residing outside the District, the College became the unwitting vehicle for reducing local jobs, incomes and purchases of goods and services. After the passage of Prop. 13 the impact of the College changed dramatically. While the residency of faculty and staff did not change, the funding source did. With the burden of funding shifted to the State, the economic impact of LBCCD shifted toward the extreme of the maximum impact model above.

CIRCULAR FLOW DIAGRAM AND THE PLAN OF STUDY

Following a brief discussion of three selected examples of literature on the impact of a college, the estimation of the impact of LBCCD will be undertaken. First, the direct impact of the College will be assessed. The primary impact attempts to estimate the impact during the first complete trip around the circular flow following the infusion of the new money from external sources. The induced impact attempts to measure the impact of recycling the money during the second and subsequent rounds.

After the estimation of the magnitude of the direct impact, the indirect impact will be estimated. The indirect impact is similar in the sense that an infusion of new money is assumed. The infusion, measured by the educational income increment, occurs in the form of higher income for consuming units. The primary impact seeks to measure the magnitudes during the first complete round in the circular flow. The induced indirect impact adds to that the multiplier effect as the initial new money is recycled through local economy.

DIRECT IMPACT

THE IMPACT OF LONG BEACH COMMUNITY COLLEGE DISTRICT

The direct impact of the College is divided into two parts, a primary impact and an induced impact. The primary impact is that impact which occurs as the immediate consequence of college expenditure. It includes the first round increase in personal income, retail sales, and employment. Also included in the primary impact is an estimate of the number of retail establishments supported.

The induced impacts are those increases in personal income, retail sales and employment stimulated by the initial, primary impact. These occur over a period of time as the initial expenditures are recycled through the community.

PRIMARY IMPACT

EMPLOYMENT

The College provides employment for over 2500 persons. Table 1 contains the breakdown by type of employment.

TABLE 1
LBCCD EMPLOYMENT, FISCAL 1981

	FULL-TIME	PART-TIME
Certificated	390	914
Classified	348	237*
Associated Study Body	28	105**
Students		292
College Work Study		222*
Totals	766	1770

NOTES: * Average QW 5 and QW 13 pay periods
** Includes students
SOURCE: LONG BEACH COMMUNITY COLLEGE DISTRICT, Office of the Director of Personnel; and Manager, Associated Student Body Enterprises (ASB)

The total payroll for Fiscal 1981 was over $24 million, approximately two-thirds of the total operating budget of the District. Table 2 contains a breakdown by certificated, classified and ASB employee categories. College work study and student employees are stated separately.

TABLE 2
RETAIL SALES GENERATED FROM COLLEGE PAYROLL
AND STUDENT AID, FISCAL 1981

Certificated Payroll (Funds 8 and 11)	$16,641,125	
Times: Percent Living in the District	51%	$ 8,466,974
Classified Payroll (Funds 8 and 11)	$ 5,689,254	
Times: Percent Living in the District	68%	3,868,693
Associated Student Body Payroll	$ 570,937	
Times: Percent Living in the District	75%	363,203
Total in District Non-Student Payroll		$12,698,870 **
Times: Ratio Retail Sales To Income		.40
Retail Sales Generated by Payroll		$ 5,079,548
Student Payroll		
College	$ 1,261,455	
ASB	133,214	
Total	$ 1,394,669 **	
Times: Retail Sales to Income	.70	
Retail Sales Generated by Student PR		976,268
Financial Aids (Excluding Loans)		
Veterans	$ 4,000,000	
Social Security	1,298,400	
SEOG	198,270	
BEOG	975,568	
EOPS	281,079	
Handicapped	171,834	
Subtotal	$ 6,925,151 **	
Student Loans	1,956,657	
Total	8,881,808	
Times: Retail Sales/Total	.70	6,217,266
Total Retail Sales Generated		$12,273,082

NOTE: ** indicates component of personal income
SOURCES: Manager, ASB Enterprises; Vice President, Business Services; Dean, Counseling and Student Services

PERSONAL INCOME

LBCCD added an estimated $21 million dollars to local personal income (See Table 2). About 30 percent of this was in the form of transfer payments (i.e., student financial aids). The remaining 70 percent was employee compensation.

In order to estimate the total payroll which remained in the District as personal income of local residents, it was necessary to identify those employees who reside within the District and those who do not. The "College Directory" was used to obtain the following percentages of employees residing in the District:

51% of the full-time certificated staff,
68% of full-time classified staff and
75% of non-student ASB employees.

Assuming the percentage of part-time employees living in the District is the same as that of full-time employees, the net compensation paid to non-student employees residing within the District was $12,698,870. The student payroll of $1,394,669 is assumed to be paid entirely to District residents.

Personal income is allocated to three general categories: payment of personal taxes, the purchase of goods and services, and savings.

RETAIL SALES

In order to estimate local retail sales generated by the $21 million personal income, the percentage of personal income used to buy goods must be determined. Using "Sales and Marketing Management" magazine data for Long Beach and Lakewood, the percentage was estimated to be approximately 40 percent for certificated and classified employees (see Appendix I for derivation). For student employees and financial aid recipients, a 70 percent estimate was used because taxes, medical and housing expenditures are relatively unimportant for student groups.

For simplicity, it is assumed that District employees who live in the District make retail purchases only within the District. Those employees who live outside the District are assumed to make no local retail purchases. While not an accurate statement of fact, it is probably not unrealistic in its effect. The local economy contains the full range of retail outlets including the Lakewood Center which has long been recognized for its regional drawing power. The practical consequence of this assumption is to assume that the expenditures of the two groups net out against one another. The assumption further avoids the tedious computation required when using a gravity model like that used by Caffrey and Issacs.

The $21 million personal income originating from LBCCD payrolls and financial aid generates an estimated $12.3 million in local retail sales on the first expenditure round (see Table 2). It should be noted explicitly that the $2 million in student loads excluded from personal income are treated as financial aid when computing retail sales.

Using the 1977 distribution of retail sales by kind of business, Table 3 distributes the $12.3 million local retail sales to various types of retail establishments

The retail sales generated by the personal incomes of College staff and students support over 14 retail establishments employing an estimated 155 persons. Using the 1977 sales per establishment restated in 1981 dollars, a distribution of establishments and employees by kind of establishment was made (see Table 4).

TABLE 3
DISTRIBUTION OF COLLEGE GENERATED RETAIL SALES
BY TYPE OF ESTABLISHMENT

KIND OF ESTABLISHMENT	PERCENT OF RETAIL SALES	DOLLAR VALUE OF RETAIL SALES
All Retail	100	$12,273,082
Food Stores	21.36	2,621,530
Automotive	20.33	2,495,118
General Merchandise	13.37	1,640,911
Food Away From Home	9.95	1,221,172
Gasoline	7.12	873,643
Building Materials	5.36	657,837
Home Furnishings	5.24	643,109
Apparel	4.64	569,471
Drug	3.85	472,514
Miscellaneous	8.74	1,072,667

SOURCE: Total retail sales, Table 2. Percentage of retail sales by establishment category, computed from data in Appendix II, Table A

TABLE 4
DISTRIBUTION OF ESTABLISHMENTS AND EMPLOYEES,
BY KIND OF ESTABLISHMENT

KIND OF ESTABLISHMENT	NUMBER OF ESTABLISHMENTS	NUMBER OF EMPLOYEES
All Retailing	14.4	155
Food Stores	1.8	21.6
Food Away From Home	4.1	54.2
Drug & Proprietary	.5	6.0
Apparel & Accessory	.7	2.4
Home Furnishings	1.2	7.2
General Merchandise	.3	24.6
Building Materials, etc.	.7	5.8
Automotive	1.1	14.5
Gasoline	1.2	5.8
Miscellaneous	3.1	17.3

NOTE: When using a price index to restate the sales per establishment, the precise index was used when known and general merchandise when not. As a result the number of employees is overstated.
SOURCE: Computed from Table 3 using data in Appendix II.

INDUCED IMPACTS

Is there any stimulus beyond the initial $12.3 million increase in retail sales? The answer is affirmative. The retail clerk who is paid from a portion of the increased supermarket sales will take a portion of his/her earnings and buy food in that same market. In addition, a portion of the clerk's income will be used in the local service station. The attendant in the local service station will in turn buy groceries.

More jobs are created. Personal income rises. Retail sales increase. These are all impacts induced as a consequence of the initial $21 million increase in personal income. Multipliers permit an estimate of the magnitude of these increases.

EMPLOYMENT

The increase in employment resulting from the initial $12.3 million increase in retail sales was estimated by using an employment multiplier. Table 5 sets forth estimated employment multipliers for a variety of areas including Los Angeles County.

TABLE 5
EMPLOYMENT MULTIPLIERS

AREA	MULTIPLIER ESTIMATE
Individual States-Range	1.2 to 4.0
-Average	2.5 to 3.0
Lancaster County, Nebraska	2.3
Los Angeles County, California	2.2
Portsmouth-Dover, New Hampshire	1.2 to 1.4
Hawaii	1.3
Ayer, Massachusetts	1.2

SOURCE: Weiss, Steven J. and Gooding, Edwin C. "Estimation of Differential Employment Multipliers in a Small Regional Economy". Federal Reserve Bank of Boston, Research Report No. 37. November 1966, page 38.

Using an employment multiplier of 2, it may be concluded that the initial 155 jobs created by the initial $12.3 million increase in retail sales will lead to the creation of another 155 jobs in the local community. The second 155 jobs are not limited to retailing but include service and local manufacturing.

PERSONAL INCOME

The increase in personal income which occurs as a result of the initial $12.3 million increase in retail sales is estimated to be $8.2 million.

The presence of the College generates 322 new jobs in the local economy as follows:

Jobs created by the initial increase in retail sales	155
Times employment multiplier	2
	310
Plus LBUSD jobs	12
Total	322

Assuming the personal income of each person is the same as the average income per household (see Appendix I), the 322 new jobs would add $8,195,000 to personal incomes in the local economy.

RETAIL SALES

If 40 percent of personal income is spent on goods, the $8.2 increase in personal income will generate an additional $3.3 million increase in retain sales.

ALTERNATE ESTIMATION: APPROACH #2

Caffrey and Issacs models were used to estimate the increase in jobs, personal income and retail sales induced by the infusion of College-derived personal income. Separate models estimate personal income and the number of jobs created. While presented in a later section, the results of these models are summarized here:

Jobs created excluding part-time	2090
Personal income	$30.4 million

If the part-time employment of the College is converted to full-time equivalents at a ratio of four part-time equivalent to one full-time job, the number of jobs increases by 440 to 2530. Adding these full-time job equivalents does not change personal income. The average personal income per job is slightly over $12,000.

Assuming retail sales are 40 percent of personal income, retail sales volume estimated from the Caffrey and Issacs models would be slightly over $12 million.

Comparing the aggregate impact, direct and induced, the two approaches produce mixed results. When compared to Caffrey and Issacs models, the initial methodology of this study yields a slightly lower personal income ($29.2 million vs $30.4), projects the creation of significantly fewer full-time jobs (1088 vs 2090), but projects higher retail sales ($15.5 million vs $12 million).

The explanation for the latter appears to originate in the computation in Table 2. The ratio of retail sales to personal income is higher for the student transfer payments and loans. In addition, the proceeds from student loans are used to estimate retail sales in Table 2 but are completely excluded from the estimate derived from the Caffrey and Issacs methodology.

The explanation for the significantly different number of jobs created lies in part in the assumption of the first method which limited the creation of jobs on the first round to retailing only. The employment multiplier was then applied to the increase in retail jobs only.

The most difficult aspect of the comparison arises from similar personal income estimates but significantly different job creation estimates. In slightly different terms, the personal income per full-time job created in the initial methodology is $26,838 ($29.2 million divided by 1088). Using the Caffrey and Issacs models, the personal income per full-time job created is $14,545 ($30.4 million divided by 2090). The Caffrey and Issacs estimate is 54 percent of that derived from the first methodology.

An alternate computation narrows the difference to about 20 percent if two adjustments are made. First, part-time jobs at the College are converted to full-time equivalents and added to the number of full-time jobs created. Assuming that one part-time job averages ten hours per week, the employment of 1770 part-timers is the equivalent of approximately 440 full-time jobs. The total number of full-time equivalent jobs becomes 1528 in the first method and the 2530 when using Caffrey and Issacs. Second, the inclusion of student financial aid tends to increase the personal income per capita. These transfer payments increase personal income but not through the wages and salaries component. If the $6.9 million financial aid is eliminated from the $29.2 million personal income of the first method, the new personal income per full-time job equivalent drops to $14,567.

ALTERNATIVE ESTIMATION: APPROACH #3

A third approach using an income multiplier suggested by Charles M. Tiebout in "The Community Economic Base Study" (Committee for Economic Development, Supplementary Paper #16, December 1962) did not appear to produce consistent results.

Tiebout uses an income multiplier with "export" income. An export industry is one which produces goods in the local economy but sells those goods primarily outside the local economy. Export income is new money which flows into the local economy from outside sources. Because of the overwhelming importance of Federal and State funding, the College is analogous to an export industry in so far as its revenues are concerned. The analogy cannot, however, be extended to the product because it probably remains in the local economy for an extended period of time.

The multiplier used to compute the increase in local incomes which result from export income is used in the equation:

$$\text{Total change in personal income} = (\text{change in export income}) \times \frac{1}{1-(\text{propensity to consume locally} \times \text{income created per dollar of local retail sales})}$$

This is merely a variation of the Keynesian national income expansion multiplier.

The estimation of the percent or fraction of an increase in retail sales which remain in the local economy as the income of others presents a major problem. This ratio is crucial to the estimation of both personal income and retail sales expansion multiplier. The easiest way to estimate this ratio and ultimately the value for an income multiplier is by an "educated guess." The probability of error in such a method is tremendous and carries with it the potential impeachment of the credibility of those who formulate and use results.

The general relationship between the size of the local community and the fraction of retail sales which remain in the community is clear: the smaller the local community, the smaller the percentage of retail sales which will remain in the local community as incomes of others.

Using Tiebout's example with the numbers developed previously herein, suppose 40 percent of each personal income dollar remains in the local community as a retail sale. The $21 million dollar initial personal income stimulus leads to an increase of $12.3 million in retail sales. If Tiebout's assumption that 40 percent of retail sales remains as the income of local residents, the retail sales increase gives rise to additional $4.9 million in personal incomes (i.e., $12.3 retail sales times 40 percent). This in turn causes retail sales to rise by about $2 million ($4.9 million times 40 percent). Forty percent of the retail sales remain in the local economy as local incomes, and so on, until the last dollar of personal sales has been accounted for as a local retail sale.

It is unnecessary to continue this process until the last added dollar of personal income and retail sales has been accounted for. The total increase in personal income can be estimated by plugging the following numbers into the equation above:

initial change in income	$21.2 million
propensity to consume locally	40%
income created per dollar of local consumption	40%

With a multiplier value of 1.19, the total increase in personal incomes would be in excess of $25.2 million. This estimate is approximately $4 to $5 million less than the estimates in either of the previous methodologies.

The inconsistency of the results is further compounded by evidence which suggests that the income created per dollar of local consumption is closer to .2 than .4. For 1977 the ratio of wages and profits to retail sales in the State of California was approximately .2. If this figure is plugged into the equation above, the value of the multiplier drops to 1.09 and the total expansion of personal income from the presence of the College drops to $23.1. The increase in personal income would be virtually stillborn.

IMPACT ON LOCAL BANKS' CREDIT BASE

The significance of bank deposits, those of the College, its staff and students, is an important element in the model developed by Caffrey and Issacs. From these deposits banks have the ability to make loans which generate additional retail sales and/or create additional jobs in the local industries.

Caffrey and Issacs admonish us that "in very fuzzy or complex cases, this analysis will be best skipped." (p. 18) This study assumes the College has no impact on the local bank credit base. This assumption appears justified for the following reasons:

(1) Commercial banks in California are typically branch banks. As a consequence, local deposits are likely to be used to support loans made outside the local community.

(2) The College deposits its funds with the County Treasurer and surplus funds are generally invested in Federal debt or certificate of deposits. As of 30 June 1981, College funds were allocated as follows:

Deposited in local banks	$ 15,000
Deposited with County	2,783,507
Certificates of Deposit	8,500,000
Federal Debt	1,000,000
Total*	12,298,507

(3) Since the vast majority of all students are residents of the local community, very little new money is added to local bank deposits by students. As a consequence, the credit base of the local community is not significantly influenced by student deposits.

(4) Since 50 percent of the full-time certificated and 33 percent of the full-time classified staff live outside the District, and given (1) above, employee deposits probably have little impact on the local credit base.

(5) Students who work for the College and/or receive financial aid would primarily use these funds to help defray normal living expenses. Given this and (1) above, bank deposits of these students probably contribute little to the local credit base.

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* Excludes ASB and ASB Enterprise funds which amounted to $1,038,3448 and $375,777 at 31 December 1981.

IMPACT RESULTS USING THE CAFFREY AND ISSACS MODEL

MODEL 1, COLLEGE RELATED BUSINESS VOLUME CRBV

Model 1 consists of three submodels:

Model 1.1	College Related Local Expenditure	= E
Model 1.2	Local Purchases by Local Business in Support of College Related Business Volume	= P
Model 1.3	Local Business Volume Stimulated by Expenditures of College-Related Income by Local Individuals Other than Faculty, Staff or Students	= BV

CRBV = E + P + BV = $25 million

CRBV = $14 million + $8.4 million + $2.8 million

MODEL 1.1, COLLEGE RELATED LOCAL EXPENDITURE, E

Model 1.1 consists of four components:

Model 1.1.1	Local Expenditure by the College	Ec
Model 1.1.2	Local Expenditure by Faculty and Staff	Ef
Model 1.1.3	Local Expenditure by Students	Es
Model 1.1.4	Local Expenditure by Visitors	Ev

E = Ec + Ef + Es + Ev = $14 million

Ec = $ 1,540,000	College Budget Fiscal 1981
Ef = $12,420,000	Retail sales, Table 2 plus rental housing
Es = $ 0	Included in 1.1.2 through Computation in Table 2
Ev = $ 0	College assumed to draw no visitors to Campus

E = $1,540,000 + $12,420,000 + 0 + 0.

MODEL 1.2, LOCAL PURCHASES BY LOCAL BUSINESS, P

P = (Mp) (E)

Mp = .6 Caffrey and Issacs, Appendix B

E = $14 million Model 1.1

P = (.6) ($14 million) = $8.4 million

MODEL 1.3, LOCAL BUSINESS VOLUME STIMULATED BY COLLEGE RELATED INCOME BY LOCAL INDIVIDUALS OTHER THAN FACULTY, STAFF AND STUDENTS

BV = (Mi) (E)

Mi = .2 Caffrey and Issacs, Appendix B

E = $14 million Model 1.1

BV = (.2) ($14 million) = $2.8 million

MODEL 2, VALUE OF LOCAL BUSINESS PROPERTY

Not estimated because of lack of data

MODEL 3, EXPANSION OF LOCAL BANKS' CREDIT BASE

Not computed, see discussion in study

GOVERNMENT MODELS

Not computed, see discussion in study

MODEL I-1, JOBS ATTRIBUTABLE TO PRESENCE OF COLLEGE

J = F + LBUSD + j (E + G)

F = number of full-time faculty and staff excludes part-time employees

LBUSD = 12 — See Study, Impact LBUSD

j = .00009 — Caffrey and Issacs, Appendix B

E = $14 million — Model 1.1

G = operating cost of government provided municipal and public school services

Public Safety Expenses	$478,000
Municipal water, gas utilities	100,900

Public safety expense, see Study City Impact
Municipal utilities, College Budget Fiscal 81

J = 766 + 12 + .00009 ($14 mil + $578,900)

J = 2090

MODEL I-2, PERSONAL INCOME OF LOCAL INDIVIDUALS FROM COLLEGE-RELATED JOBS AND BUSINESS ACTIVITIES

PI = PIc + (p) (E)

PIc = College payroll to in district residents plus Transfers

p = payroll and profits per dollar direct expenditures

E = College-related local expenditure

PIc = $21 million — See Table 2, Study

p = .66 — Caffrey & Issacs, Appendix B

E = $14 million — Model 1.1

PI = $21 million + (.66) ($14 million) = $30.4 million

INDIRECT IMPACT

THE IMPACT OF COMMUNITY COLLEGE EDUCATION

EDUCATION AND PRODUCTIVITY

"Truly, it can be said, the productive capacity of labor is predominantly a produced means of production. We thus 'make' ourselves and to this extent 'human resources' are a consequence of investments among which schooling is of major importance."

T. W. Schultz, The Economic Value of Education. P 10.

INTRODUCTION

The most significant impact of Long Beach Community College District on the local community is indirect, arising from the increased productivity of students. Somewhat paradoxically this impact can be readily determined but it is almost impossible to attribute directly to LBCCD. Nonetheless the difficulty in attributing this impact to the College is insufficient reason to ignore it. However, before the magnitude of this impact is estimated, a general discussion of the relationship between education and productivity will serve as useful background.

Educational level and years of on-the-job experience are two of the most important factors influencing productivity. (Productivity is defined as output per man hours.) During the last half decade, the growth in productivity has declined from approximtely 2.3 percent per year to less than one-half of one percent per year. The decline can be traced to a number of factors. First, the formation of real capital has declined both quantatively and qualitatively. Not only has capital formation failed to keep pace with the growth in the number of persons in work force but much of the capital created has been more environmentally than economically productive. Second, there has been a decline in the level of job experience due to increased early retirement and the tendency toward a younger work force as a consequence of the post World War II baby boom.

A long-run trend potentially aggrevating the decline in productivity is a reduced rate of increase in research and development expenditures. During the past decade, the reate of increase has been cut by approximately 50 percent.

The community college is in an especially advantageous position to efficiently provide the educational opportunities required to restore productivity growth and the American Economy to its previous growth levels. Since this study is concerned with the local impact of Long Beach City College, the impact of increased productivity on the national economy is of peripheral concern. Notwithstanding this, it should be noted in passing that educational expenditures of the College which increase productivity tend to lower inflation rates and influence the rate at which the economy is

able to create new jobs. In addition, increased productivity tends to lower the incidence of unemployment which in turn not only reduces governmental expenditures but also increases governmental revenues. Of direct significance to Long Beach, increased productivity tends to lower labor costs, make dometic products more competitive in world markets, and thus stimulate exports.

To illustrate the relationship between education, productivity and production costs, suppose a person decides to attend LBCC for five months to acquire or upgrade a skill. Assume further that prior to enrollment this person is paid $5 per hour and has a productivity of 20 units per hour. His/her per unit labor cost is $0.25 per unit. As a result of the new or upgraded skill, productivity rises by 10 percent. Upon returning to work, his/her productivity increases to 22 units per hour. Given the hourly wage rate, the per unit labor cost drops to $0.227. The employer now has four possible options: (1) to cut the price of the object by $0.023 thereby helping to lower or eliminate inflationary pressures, or (2) to increase the employee's wage rate to $5.50 per hour without lowering the employer's profits, or (3) to increase profits giving the employer the ability to create more machinery (i.e., real capital) with which to further increase the worker's productivity, or (4) to increase research and development expenditures out of increased profit.

The importance of the community college is heightened during periods of economic decline when unemployed workers can upgrade and learn new skills in an educational system at little or no out of pocket cost. Quite unintentionally legislative bodies may hamper the growth of productivity in their own state and that of the entire economy by limiting funds and/or enrollment. Much like the decline in real capital formation which contributed to decline in the rate of productivity increases during the past decade, limiting the ability of the educational system to create human capital will likewise contribute to delining productivity.

EDUCATION, PRODUCTIVITY AND INCOME

Education is a major factor contributing to the earning capacity of the individual and the growth of the entire economy. Expenditures for the education of a human being increase his/her productive capacity. The increase in productive capacity is measured by productivity and reflected in the increased income associated with the increased educational level.

When a person chooses education as an alternative to work, he/she chooses to give up or forego current income. The income which the individual gives up constitutes an investment analogous to putting money in a savings account. And continuing the analogy, the individual expects to receive a rate of return on the foregone earnings in much the same way interest is paid on a savings account.

Continuing the previous example, assume that after the five-month educational leave, the employer chooses to pay the employee an extra $0.50 per hour. The increased income is the direct result of increased productivity attributable to the added education.

For the employee who took the leave to attend school, the rate of return is 24 percent. Assuming the person works 40 hours per week and takes a two-week unpaid vacation, he/she would receive an educationl income increment of $1000 during the twelve month period immediately following his/her return to work. While in school, he/she sacrificed approximately $4200 in income. The rate of return to the extra five months of education is 24 percent per annum (i.e., $1000/$4200). It would, of course, be reduced to some extent by the imposition of income taxes on the extra income.

What is an acceptable rate of return? And how does it influence the decision to work or study? The rate of return must be sufficient to recover the cost and leave a profit. Suppose the individual in the example above has accumulated $4200 in a savings account. He/she has a choice: to leave the money in the bank and earn 5 percent interest or invest the $4200 in his/her education with a 24 percent rate of return. Ignoring the loss of liquidity, the choice is fairly simple on the surface. Would you prefer $210 per year in interest income or $1000 per year in additional wages? On the surface the answer may seem apparent. More is better than less.

However, in reality the choice is more complicated. Retention of $4200 in a savings account means the loss of higher income from the extra education. The choice depends on the interest rate paid on the $4200 and the number of years over which the $1000 income can be expected to continue. If a person with increased productivity works for five and a half years, both the initial $4200 outlay and compound interest thereon at 5 percent will be recovered. And this fails to consider the impact of the two-edged sword of inflation. On the one hand, the value of the labor will tend to be increased by inflationary pressure. On the other hand, the purchasing power of the $4200 principle will erode as prices rise.

Education which increases productivity is literally better than money in the bank.

IMPACT OF EDUCATION ON LOCAL PERSONAL INCOME

Census data provide information on income and educational achievement by age group. Since the 1980 Census data will not be available until the end of 1982, the 1970 Census data was used as a starting point. Income data for the Los Angeles-Long Beach SMSA is contained in Table 6.

TABLE 6
MEAN INCOME OF PERSONS 18 AND OVER
LOS ANGELES-LONG BEACH SMSA, BY AGE AND
YEARS OF SCHOOL COMPLETED, 1970 CENSUS

	YEARS OF SCHOOL COMPLETED		INCREASE FROM EXTRA SCHOOLING	
	4 Yrs Hi Sch	1-3 Coll	$	%
Men				
18 and over	$ 8430	$ 9301	+ 871	3.32
18 to 24	3872	3526	- 346	-8.94
25 to 34	8333	9016	+ 683	8.20
35 to 44	10201	12043	+ 1842	18.06
45 to 54	11161	13681	+ 2520	22.58
55 to 64	10412	12648	+ 2236	21.47
65 and over	6022	7735	+ 1713	28.45
Women				
18 and over	4059	4517	+ 458	12.84
18 to 24	2930	2924	- 6	- .20
25 to 34	4200	4967	+ 767	18.25
35 to 44	4584	5176	+ 591	12.89
45 to 54	4942	5761	+ 819	16.57
55 to 64	4815	5841	+ 1026	21.30
65 and over	3174	4048	+ 874	27.54

SOURCE: U.S. Bureau of Census, 1970 Census: Detailed Characteristics, California. Table 197.

Several conclusions can be drawn from Table 6. First, with the exception of the 18 to 24 age group, those who have completed one to three years of college have higher incomes than those with high school diplomas. The income decline for the 18 to 24 age group would be expected as those attending college forego current income. Second, average income begins to decline for the 55 to 64 age group reflecting early retirements. Third, the percentage income increase for women in the 45 and over categories is comparable to that of men. Women in the 25 to 34 age bracket experienced a significantly greater increase than men the same age. A possible explanation for this increase is provided by the Bureau of Labor Statistics "Monthly Labor Review."

> "The availability of occupational training at community colleges, as well as the convenient locations of such schools, have particularly benefited women, both recent high school graduates and older workers, by providing an opportunity to acquire para-professional training for a wide variety of jobs." (July 1980, p 44)

Table 6 does not permit us to determine the average income increase for all income earners as a group. Nor does it reveal the relative importance of each age group or the relative importance of men and women. Appendix III uses the data in Table 6 together with the number of persons in each age/sex group to compute an average for all income earners. In 1969 dollars the average educational income increment was estimated to be $1265. Adjusted for inflation, the average income improvement during 1980 was estimated to be between $2845 and $3017.

The range from $2845 to $3017 is the result of adjusting the $1265 educational income increment by an index of the average weekly earnings of non-agricultural workers and the consumer price index respectively. During inflationary periods wages generally tend to lag increases in consumer prices. For this reason $2850 will be used herein to estimate the value of community college education to the local community.

At the time of the 1970 Census there were 17,515 households in Long Beach with one to three years of college. Separate data for Lakewood was unavailable. However, granted a few assumptions, an estimate for Lakewood can be made. First, the percentage of the population with one to three years college is the same in both cities. Second, 80 percent of Lakewood's population resides in LBCCD and is equal to 14 percent of the Long Beach total. From this it can be concluded that about 2500 persons with community college level education reside in Lakewood. The District total would be about 20,000 at the time of the 1970 census.

There is no way to determine with certainty where these 20,000 received their community college level educations. Some received their education in Long Beach. Some received education outside Long Beach and moved into the District. (And, of course, some who attended LBCC have moved from the District.) It is this migration which makes it impossible to assign to LBCCD the entire educational income increment for these 20,000 persons. For purposes of estimating the economic impact of the District, a quid pro quo will be assumed.

However, with relatively stable total population in the District from 1970 to 1980 and District ADA relatively stable between 15,000 and 16,000 over most of the period, it would be reasonable to assume further that the District is maintaining the status quo. As a consequence, the estimation of the economic impact of community college education provided by LBCCD will assume 16,000 persons.

Viewed in a slightly different context, the role of LBCC may be viewed as analogous to a river which maintains the level of water in a reservoir. While some with one to three years of college may leave the community, LBCC replaces them causing the level of the reservoir to remain constant.

Community college level education increases personal incomes in the District by at least $45.5 million (see Table 7).

TABLE 7
COMPUTATION OF ANNUAL INCOME INCREASE,
COMMUNITY COLLEGE LEVEL EDUCATION, FISCAL 1981

Estimated Educational Income Increment Per Person	$ 2,850
Times: ADA	16,000
Total Annual Income Increase	$45,600,000

The decade of the 1970's has seen two trends which could substantially alter the estimated impact of the College. First, the labor participation rate among women with community college level educations has increased by 40 percent in the past five years. Two opposing forces emerge. On the one hand it tends to increase the number of persons receiving incomes. In opposition to this, women are generally paid less than men and the increase associated with their education increment is less than that of men. (Refer to Table 6.)

A second trend is the rising relative importance of minority population in the District. On the one hand this tends to reduce the number of persons within the community with community college education levels. On the other hand, there is a tendency for the rate of return on community college educational levels to be much higher for minorities, especially men.

RETAIL SALES AND EMPLOYMENT

Using the same procedure employed when the direct impact of College payrolls and financial aid was estimated, it is estimated that the community college educational increment annually generates $21.9 million additional retail sales and provides employment for 275 additional persons in retail trade. Using the differential employment multiplier, an additional 275 persons are employed in the local economy as a consequence of the increased retail sales. The computation may be found in Table 8.

TABLE 8
COMPUTATION OF RETAIL SALES
AND EMPLOYMENT RESULTING FROM THE EDUCATIONAL INCREMENT

Annual Increase in Local Incomes	$45,600,000
Times: MPC	.45
Increase in Retail Sales	$21,888,000
Divided by: Sales per Establishment	$ 849,828
Increase in Establishments	25.8
Multiplied by: Employees per Establishment	10.7
Jobs in Retail Trade	276
Multiplied by Differential Employment Multiplier	2
Extra Jobs from Income Increase	551

NOTES: (1) Increase in income, see Table 7
(2) MPC is the marginal propensity to consume. Its value was estimated from Appendix I as follows:

$$\frac{RPLB - RPMB}{TBLB - TBMB}$$

where RPLB is retail purchases, lower budget
RPMB is retail purchases, middle budget
TBLB is total budget, lower budget level
TBMB is total budget, middle budget level
(3) Retail sales per establishment, see Table IIC
(4) Employees per establishment, see Table IIB
(5) Differential employment multiplier, see Table 5

IMPACT ON OTHER LOCAL GOVERNMENTS

LONG BEACH UNIFIED SCHOOL DISTRICT
CITY OF LONG BEACH
CITY OF LAKEWOOD

IMPACT ON LONG BEACH UNIFIED SCHOOL DISTRICT

The impact of LBCCD on the Long Beach Unified School District (LBUSD) would appear to be neutral to slightly favorable. After the passage of Proposition 13, the burden of K-12 funding passed from the local property tax base to State apportionments. The tax exempt status of LBCCD facilities does not appear to have a negative impact on LBUSD revenues. Quite the contrary, with over 75 school sites and eight times as much land, the tax exempt status of LBUSD property would appear to impose on balance a small net burden on the College.

Based on a sampling of full-time staff, LBCCD adds an estimated 175 school age children to LBUSD enrollments. The sample revealed an average of about one-half school age child per employee. There was a tendency among staff members residing outside the District to have a higher ratio of children per employee. With about 750 full-time employees, 42 percent of whom live outside the District, LBUSD would appear to utilize five classrooms to support the student population originating from LBCCD employees. While this may appear to be a significant impact, it diminishes in relative importance when viewed against the backdrop of the entire LBUSD operation. LBCCD generated students are less than three-tenths of one percent of the total LBUSD enrollment, an average of about two and a half percent per school site. On the margin this would not appear to be a significant impact.

In addition, LBUSD employees have children attending LBCC. There is no practical way to determine the size of that enrollment. However, the net impact of LBCCD is considerably less than the 175 suggested above.

Given State support and declining enrollments in LBUSD, the presence of LBCCD generated students probably has a positive impact on the local economy. With 14 employees per ADA, the 175 students preserve 12.5 full-time jobs. By preserving these jobs, LBCCD helps to maintain jobs, incomes and retail sales in the local community.

Part-time LBCCD employees (student and non-student) do not appear to have any significant impact on LBUSD. Most student employees of LBCCD do not have children. To the extent they do have children, they would be enrolled in LBUSD independently of parental employment by LBCCD. Part-time non-student employees who are residents of the District would likewise have children who would be enrolled in LBUSD independently of parental employment by the College.

The student population of the K-12 District derived from LBCCD students was not assessed. It would be significant only to the extent that a family moved to LBCCD for the express purpose of attending LBCC. Even if significant in numbers, the negative impact on the local community would be largely mitigated by the State apportionments which fund the bulk of the LBUSD expenses.

IMPACT ON THE CITY OF LONG BEACH

LBCCD appears to have a neutral to slightly negative impact on the City of Long Beach. This impact was difficult to evaluate because of the variety of costs which each entity imposes on the other. For analytical purposes three areas were identified: (1) the costs which the City of Long Beach imposes on the College District, (2) the benefits which the College returns to the City, and (3) the costs which the College District imposes on the City.

COSTS THE CITY IMPOSES ON THE COLLEGE

The tax exempt status of City property results in a loss of College property tax revenue. During Fiscal 1981 the loss was estimated to be $200,000. Table 9 contains the fiscal 1979 appraised value of City property excluding the value of the City/County Civic Center Authority which is not under City control. The combined value of these assets was $490 million on June 30, 1979. Adjusting this value for the two percent inflation factor allowed by Proposition 13, the full market value of these assets for Fiscal 1981 was estimated to be $500 million.

TABLE 9
APPRAISED VALUE OF CITY PROPERTY
BY FUND, 1979 APPRAISAL

CATEGORY	FUND		
	ENTERPRISE	GENERAL FIXED ASSETS GROUP	FIDUCIARY NON-EXPEND
Land	$ 19,235,352	$ 1,501,543	$ 53,366,306
Buildings	9,269,011	54,130,578	238,773,789
Equipment	113,231,915	0	0
Totals	$143,231,278	$ 55,632,121	$292,140,095

NOTES: (1) Enterprise fund includes gas and water distribution, airport and golf courses. Their accounting practices are similar to private enterprise.
(2) General fixed assets include assets held as custodian to finance programs and projects.
(3) Fiduciary non-expendable trust fund include assets held by the City to finance programs or projects for specific purposes.

SOURCES: City of Long Beach, "Budget," Fiscal 1980.

During Fiscal 1981 the College received property tax revenues at the rate of four cents per $100 of full market value. The $500 million tax exempt City property results in a $200,000 revenue loss for the College.

BENEFITS WHICH THE COLLEGE RETURNS TO THE CITY

The benefits which the City derives from the presence of the College fall into three categories: (1) tax and other revenues paid to or collected on behalf of the City, (2) sales tax collections derived from the retail sales generated by the direct primary and direct induced impacts, and (3) sales tax collections generated from the educational income increment.

During Fiscal 1981 the College paid to or collected on behalf of the City an estimated $74,551. These funds were derived from three sources: (1) sales tax collections by Associated Student Body Enterprises, operator of the College Bookstore, (2) the City tax and utility billings, and (3) the College's share of the profit from the City owned gas utility. The City's share of the $108,013 in sales taxes collected by the ASB Enterprises is $18,013. The 6 percent City tax on public utility billings resulted in an additional $45,738. (During Fiscal 1981 College expenditures for utilities amounted to $808,032 including tax.) Third, the profit component of the City's gas utility is approximately 16 percent of revenues. One-sixth of the $63,434 (net of utility billing tax) for heating fuels adds another $10,800 to the total payments which benefit the City.

Sales tax revenue generated from the educational income increment and the direct impact of the College's operation amounts to an additional $332,000 benefit to the City. The derivation of this benefit will be found in Table 10.

COSTS THE COLLEGE IMPOSES ON THE CITY

During Fiscal 1981 the College cost the City an estimated $641,800 in lost property tax revenue and public safety costs.

The tax exempt status of College property reduces City property tax collections by an estimated $163,800. The College balance sheet for June 30, 1981 shows land, buildings and equipment valued at approximately $63 million. Under post-Proposition 13 legislation, the City receives property tax revenues at the rate of 26 cents per $100 of full market value. The property tax revenue lost through exemption of College property is thus

$$\$163{,}800 = \frac{26 \text{ cents} \times \$63 \text{ million}}{100}.$$

TABLE 10
ESTIMATED SALES TAX COLLECTION DERIVED FROM
PRESENCE OF COLLEGE AND EDUCATIONAL INCOME INCREMENT
CITY OF LONG BEACH, FISCAL 1981

Retail Sales: Direct Impact	
Derived from personal income of College Faculty/Staff/Students	$ 12,273,082
From jobs created by above	1,700,060
Multiplier from jobs created	1,577,900
Retail Sales: Indirect Impact	21,900,000
From jobs created by above	2,809,680
Multiplier from jobs created	2,809,680
Total	$ 41,470,402
Times: $0.01 local sales tax per dollar of retail sales	$ 0.01
Increase in sales tax collections within the College District	$ 414,704
Allocation based on population	
Long Beach (80%)	$ 331,763
Lakewood (20%)	$ 82,941

The value of public safety, police and fire are a benefit which the College receives from the City. It also is a cost which the College imposes upon the City. A variety of techniques were attempted to assess accurately the magnitude of these costs. All failed for lack of data.

A less sophisticated approach was suggested by the availability of property values for the College and the assessed value of the City of Long Beach. Public safety costs were allocated to the College on the basis of the ratio of the value of College property to the assessed full market value of the City of Long Beach. Excluding those public safety costs that did not appear to involve the College either directly or indirectly, the public safety budget for fiscal 1981 was estimated to be $66 million. An estimated $478,000 was allocated to the College as its share of the City's public safety cost. Table 11 contains the detail of this computation.

TABLE 11
ALLOCATION OF PUBLIC SAFETY COSTS TO THE COLLEGE

Assessed value, City of Long Beach	$ 2,121 million
plus: Redevelopment agency exempt	54 million
Total City assessed value	$ 2,175 million
times: full market/assessed value	4
City of Long Beach full market value	$ 8,700 million

$$\frac{\text{Value College property}}{\text{City full market value}} = \frac{\$63 \text{ million}}{\$8{,}700 \text{ million}} = .00724$$

Estimated City public safety cost	$ 66 million
times: College share	.00724
Public safety costs allocated to LBCCD	$ 477,931

SUMMARY

On balance the College appears to have a neutral impact on the City of Long Beach. Financially, there is a small net negative impact (see Table 12). Mitigating this negative impact are three influences excluded from the numbers. First, the College provides free educational services for City employees and their families. There is no practical way to evaluated the number of full-time equivalent students. Second, the College maintains its own campus police department. As a consequence, the cost of public safety allocated to the College is overstated. Third, business license revenues which the City derives from the businesses supported by the direct and indirect impacts are not included.

TABLE 12
SUMMARY OF IMPACT OF LBCCD ON CITY OF LONG BEACH
FISCAL 1981

BENEFITS THE COLLEGE RETURNS TO THE CITY		
Increased sales tax revenue		$ 331,763
Sales tax from College Bookstore		18,013
Utility billing tax		45,738
Profit contribution-City gas utility		10,800
Subtotal-Benefits		$ 403,314
PLUS: COSTS CITY IMPOSES ON COLLEGE		
Loss of College property tax revenue		200,000
Subtotal		$ 603,314
LESS: COSTS COLLEGE IMPOSES ON CITY		
Public safety	$ 477,931	
Loss of City Property tax revenue	163,000	$ 640,931
Net Impact		$ -37,617

IMPACT ON THE CITY OF LAKEWOOD

The City of Lakewood received an estimated $80,000 in benefits from sales tax revenues generated by the direct and indirect impacts of the College (see Table 10). Lakewood does not appear to bear any additional costs because of the presence of the College.

UNQUANTIFIED IMPACTS

REDUCTION OF POVERTY AND UNEMPLOYMENT

"An investment in knowledge always pays the best interest."

Benjamin Franklin

INTRODUCTION

Some impacts cannot be readily quantified. These fall into two categories. The first category was not measured and is therefore excluded from any of the numbers included herein. While the cost benefit ratio to quantify these impacts appears to be excessive, they are nonetheless included to the extent they were identified. These will be referred to as excluded impacts.

The second category includes impacts which appear on the surface to be captured elsewhere, generally in the educational income increment. While disaggregation of the total indirect impact of the college would serve no useful purpose, some of the detail embedded in that total warrants explicit discussion. Our attention turns first to this.

The relationship between education and productivity was developed in a previous section. It was observed that investment in human capital increases productivity through education. Not only does this lead to higher incomes but also permits more people to work at the prevailing wage rate. While the increased incomes are included in the aggregate economic impact of the District, the complementary effects of reduced unemployment and a reduction in the number of families below the defined poverty line are not. This section deals with these.

UNEMPLOYMENT

The relationship between education and unemployment is shown in Table 13. The higher the level of educational achievement, the lower the unemployment rate.

The significance of one to three years of college education can be easily obscured by a superficial comparison of the unemployment rates. Suppose there are 1000 male high school graduates. Five and a half percent or 55 would have been unemployed in March 1979. If these 55 enroll in a community college, we would expect their unemployment rate to drop to 4.2 percent after graduation. The number unemployed would thus drop from 55 to 3, a 95 percent reduction in the number unemployed.

TABLE 13
UNEMPLOYMENT RATES, BY EDUCATIONAL ACHIEVEMENT AND SEX
MARCH 1970 AND MARCH 1979

EDUCATIONAL ACHIEVEMENT	MEN		WOMEN	
	1970	1979	1970	1979
Less than 4 years of high school	4.8%	8.3%	6.8%	10.4%
Four years of high school	3.4	5.5	4.6	6.0
One to three years of college	3.8	4.2	4.0	4.3
Four or more years of college	1.2	1.8	2.0	3.0

SOURCE: U.S. Department of Labor. "Monthly Labor Review", July 1980, p 45.

Table 13 is interesting in two other respects. First, men with one to three years of college had a higher unemployment rate in 1970 than male high school graduates. By 1979 male high school graduates had a substantially higher unemployment rate than men with one to three years of college. This would suggest the increasing importance of community college education during the past decade.

TABLE 14
PERCENTAGE CHANGE IN UNEMPLOYMENT RATES, MEN AND WOMEN
BY EDUCATIONAL LEVEL, 1970 TO 1979

EDUCATIONAL ACHIEVEMENT	PERCENTAGE CHANGE IN THE RATE OF UNEMPLOYMENT	
	MEN	WOMEN
Less than four years of high school	73%	53%
Four years of high school	62%	30%
One to three years of college	11%	8%
Four or more years of college	50%	50%

SOURCE: Table 13.

Second, during the period from 1970 to 1979, the unemployment rate rose for both men and women. No level of educational achievement was immune. However, both men and women with one to three years of college experienced a smaller percentage increase in unemployment rates than any other group. This may be seen in Table 14.

Table 15 presents the detail of the March 1979 unemployment rates by age. Examination of this data reveals the same relationship between unemployment and education. Except for women 55 and over, the rate of unemployment among persons with one to three years of college is lower than the rate of unemployment among high school graduates.

TABLE 15
UNEMPLOYMENT RATES, BY SEX, AGE AND
EDUCATIONAL LEVEL, MARCH 1979

	EDUCATIONAL ACHIEVEMENT		RATIO
	HI SCH GRAD	1-3 COLLEGE	HS TO COLLEGE
ALL MEN, 18 & Over	5.5%	4.2%	1.31
18 to 24	10.0	8.0	1.25
25 & Over	4.1	3.1	1.32
25 to 54	4.1	3.3	1.24
55 & Over	3.9	1.9	2.05
ALL WOMEN, 18 & Over	6.0	4.3	1.40
18 to 24	10.2	5.8	1.76
25 & Over	4.6	3.7	1.24
25 to 54	4.9	3.0	1.63
55 & Over	3.2	3.4	.94

SOURCE: U.S. Department of Labor. "Monthly Labor Review", July 1980, p 45.

The importance of community college education to women with one to three years of college is underscored by an increase in the labor participation rate for this group was accompanied by the smallest percentage increase in the unemployment rate (see Table 14). The July 1980 "Monthly Labor Review" observes:

> "When ranked by age and years of school completed, the greatest surge occurred among those (women) 25 to 34 with one to three years of college. Their labor force participation rate rose from 45 percent to 67 percent between March 1970 and March 1979 ....The increasing labor force participation of women is related, in part, to the growing proportion of women with post-secondary education. By 1979, 34 percent of female workers had completed at least one year of college, compared with 24 percent in 1970. Over the same nine-year period, the number of women awarded associate degrees nearly tripled, while the number of men receiving such degrees almost doubled. As a result, women accounted for 50 percent of all associate degrees in 1979-up from 42 percent in 1970-and nearly equaled men in the proportion completing vocationally oriented science and engineering-related courses. The availability of occupational training at community colleges, as well as the convenient locations of such schools, have particularly benefited women, both recent high school graduates and older workers, by providing an opportunity to acquire para-professional training for a wide variety of jobs."

The health technology program at LBCC illustrates this phenomenon. Since 1961, over 3500 persons, mostly women, have graduated in health technology:

1490 RN's
723 graduate nurses
62 vocational nurses
379 dental assistants
418 medical assistants
219 x-ray technicians
200 health technicians.

Against the backdrop of rapidly changing medical technology, LBCC has provided a dual service. First, people have been trained to perform work, thereby reducing the probability that they would become a burden to society through unemployment benefits or welfare payments. Second, the acute shortage of health care professionals, especially nurses, has been lessened by the presence of LBCC. In the latter instance there is no way to evaluate the economic value of the lives saved because LBCC provided more trained health care workers in the local community.

UNEMPLOYMENT AND POVERTY

Many people live below the poverty level because they are unemployed, underemployed or unemployable. It has already been observed tnat the higher the level of educational achievement the less likely one is to be unemployed. In the next section a complementary relationship will be developed: the higher the level of educational achivement the less likely one is to have a poverty level income. The explanation of the complementary effects of unemployment and poverty is not difficult. Those with less education generally have fewer skills, their productivity is lower, and the wages which they receive are correspondingly low. Or a person may not have sufficient skills and/or productivity to warrant being paid the legally mandated minimum wage.

Table16 contains detail on the relationship between employment and poverty. At the time of the 1970 Census, there were 7,263 families in Long Beach headed by civilians with incomes below the poverty level. Of the 2897 poverty families participating in the work force about 25 percent worked full-time (i.e., worked 50 to 52 weeks). Another 25 percent were unemployed or did not work at all during the year. And about 22 percent worked less than half a year.

TABLE 16
EMPLOYMENT STATUS OF BELOW POVERTY LEVEL CIVILIAN FAMILIES
LONG BEACH, 1970 CENSUS

EMPLOYMENT STATUS OF FAMILY HEAD	MALE HEAD	FEMALE HEAD	TOTAL
Employed, 26 weeks or less	354	307	661
27 to 39 weeks	137	156	293
40 to 49 weeks	270	130	400
50 to 52 weeks	624	165	789
Did not work	131	141	272
Subtotal-Employed	1516	899	2415
Unemployed	298	184	482
Number in Work Force	1814	1083	2897
Not in Work Force	1801	2565	4366
Civilian Families Below Poverty	3615	3648	7263
Plus Military Families			366
Total Families Below Poverty			7629

SOURCE: U.S. Bureau of Census. "1970 Census: Detailed Characteristics, California." Table 210.

REDUCTION IN POVERTY

Table 17 contains data from the 1970 Census on the relationship between educational achievement and poverty. (Poverty in this context may be viewed as a consequence of underdeveloped labor productivity.) Within the City of Long Beach 7.6 percent of the families headed by high school graduates had incomes below the poverty level. In contrast 5.4 percent of the families headed by a person with one to three years of college were below the poverty level.

Of the 7600 families* in Long Beach below the poverty level, about 2400 were headed by persons with four years of high school.

* This study excludes unrelated persons who were below the poverty level and not part of a family.

The potential impact of community college education can be seen in the following "what if" example. Suppose there are 1000 household headed by high school graduates. Table 17 suggests that 76 of these will have incomes below the poverty level. Assume the 76 are capable of assimilating further education and that they enroll in a two-year LBCC program which provides them with a useable job skill (i.e., increase their productivity). Table 17 suggests that at the conclusion of the two-year period only four of the 76 (i.e., 5.4 percent) will remain below the poverty level. As a consequence of two years at a community college, the number of families below the poverty level would be reduced by 72, a 95 percent reduction.

TABLE 17
PERCENTAGE OF FAMILIES BELOW POVERTY LEVEL
BY YEARS OF SCHOOL COMPLETED, 1970 CENSUS

GEOGRAPHIC AREA GROUP	EDUCATIONAL ACHIEVEMENT		DIFFERENCE
	HI SCH GRAD	1-3 COLL	
State of California	7.3%	5.3%	-2.0%
Urban California	7.2	5.1	-2.1
City of Los Angeles	9.0	5.5	-3.5
Negro Families	20.6	10.9	-9.7
Spanish Surname	11.1	6.3	-4.8
All, Age 25-64	8.0	4.8	-3.2
Spanish 25-64	10.2	5.6	-4.6
City of Long Beach	7.6	5.4	-2.2
Spanish Surname	7.9	8.1	+0.2
Age 25-64	6.2	4.6	-1.6
Spanish 25-64	6.2	4.6	-1.6

SOURCE: Census Bureau, 1970 Census, "California: Detailed Characteristics," Table 211.

Removing the 72 families from the public assistance rolls results in an annual, lifetime savings for government. Assume the average poor family receives $7000 in cash and in-kind.* Public assistance expenditures would be reduced about $500,000 per year.

Generalizing this example to the City of Long Beach, the potential saving in public assistance could reach over $1.6 million per year from a 236 reduction in the public assistance rolls. Excluding poverty families in Signal Hill and Lakewood and all unrelated persons in the District, assume that Fiscal 1981 conditions approximate those in existence at the time of the 1970 Census:

* The Department of Social Services, Long Beach estimates that AFDC for a family of four is $601 per month excluding medicaid, food stamps and rental assistance.

- high school graduates with poverty level income have the same rate of participation in the work force as the average suggested in Table 16 (i.e., 40 percent),
- the rate of unemployment plus "did not work during the year" is the same among high school graduates as it is in the general population, 25 percent (see Table 16).
- 2360 families in the poverty category are headed by high school graduates.

Put in a slightly different perspective, the reduction of the public assistance rolls by 236 would provide funds for the College to provide educational services for 750 full-time students.

What would it cost the government to eliminate the annual stream of $7000 payments to a poverty family? The $7000 per family is essentially a fixed cost which must be paid anyway. Assume none of the poverty heads of households attend college initially. The cost to LBCC to enroll each for a two-year period would be about $5000. Excluding the private return to the individual and any added non-economic benefits which might accrue to either the individual or society, the choice becomes analogous to that of a business decision regarding the acquisition of a new piece of machinery. Should $5000 be spent over a two-year period in order to realize a saving of $7000 per year over the next 5, 10, 15, 20 or 25 years?

On the surface the answer would seem obvious. Comparing the $7000 third-year savings in public assistance expenditure to the two-year LBCC cost of $5000 yields a benefit cost ratio of 1.4:1. In the fourth year there is another $7000 saving but the benefit cost ratio does not double to 2.8. The second $7000 saving must be reduced to its present value, $5933 using an 18 percent discount rate. The ratio of benefit to cost is 2.59. (Appendix VI contains the present value factor of $1 at selected interest rates over various periods of time.) The present values of an annual stream of $7000 savings together with the resulting benefit cost ratios can be found in Table 18.

Assume that a poverty level head of household completes two years at LBCC at age 30. Assume further that this person is able to work for 25 years. The aggregate saving in public assistance expenditures over the 25-year period would be $175,000. Using an 18 percent discount rate, the stream of $7000 annual payments over a 25-year period has a present value of $38,268.

To further appreciate the impact of community college education, consider the following question: Would you pay $5000 today for an asset whose present value is $40,000? With a benefit to cost ratio of 8, the private sector of the economy would jump at such an opportunity with little second thought. It is curious that when the public sector is faced with difficult choices, it has shown so little interest in investing in such high return projects.

It is doubtful that many private or public investments yield the return that the investment in human capital yields.

TABLE 18
PRESENT VALUE OF STREAM OF $7000 ANNUAL SAVINGS
RATIO OF BENEFIT TO $5000 COST
SELECTED INTEREST RATES AND WORKING YEARS

	RATE OF INTEREST			
	10%		18%	
WORKING YEARS	PRESENT VALUE OF $7000 STREAM	RATIO OF BENEFIT TO COST	PRESENT VALUE OF $7000 STREAM	RATIO OF BENEFIT TO COST
1	$ 6364	1.27	$ 6035	1.21
2	12149	2.43	10959	2.19
3	17408	3.48	15220	3.04
4	22189	4.44	18831	3.77
5	26536	5.31	21890	4.38
10	43012	8.60	31459	6.29
15	53166	10.63	35597	7.12
20	59595	11.92	37469	7.49
25	63539	12.70	38268	7.65
30	65998	13.20	38617	7.72

(It is ironic that current funding of community colleges in California would discourage any attempt to enroll poverty level heads of households. At the time of the 1970 Census, there were 2360 families in Long Beach headed by high school graduates below the poverty level. Assume this number remains constant. If LBCC enrolls 2360 new full-time students, a 15 percent increase in ADA would occur. The consequence of such an increase would be to cut funding to the point where educational resources would be significantly reduced for both the 2360 and the balance of the College's 16000 ADA. Whenever there is a choice, there is always a cost. There is no free lunch for society.)

Despite the exclusion of reduced public assistance payments from the aggregate impact of the College, it can be stated that reduction in poverty level families is a positive impact of the College, but probably not at the local level.

EXCLUDED IMPACTS

The following impacts are known to exist but their magnitude is not included in this study. The general reason for exclusion is the lack of data.

(1) Negative externalities that may accrue to homeowners located in close proximity to the Liberal Arts Campus. The College is likely to impose costs in the form of reduced property values originating from increased traffic volumes on residential streets, parking, noise, etc. Partially offsetting these adverse externalities is a possible increase in property value for those with rental units near the College.

(2) The savings to District residents who enroll in LBCC for the first two years of College. Assume that 20 percent of the ADA is enrolled in transfer programs. Further assume that each ADA saves $350 per year by attending LBCC rather than California State University, Long Beach (refer to Table 19). The agggregate saving for local residents would be over $1.1 million per year ($350 x 3200 ADA). This represents purchasing power which remains in the local economy and under the control of local residents.

TABLE 19
AVERAGE COST PER FTE, CSU
1980-81

FUNDING SOURCE	AV COST/FTE
State Appropriation	$ 4026
Student Charges	387
Federal (Financial Aid)	239
Total	$ 4652

NOTES: FTE is 15 units of academic credit.
Student charges include $134 student services fee, health facilities fee, College Union fee, student body fee
SOURCE: California State University Fullerton, 1981-1983 Calalog, p 56.

(3) The Community College is the most efficient way to provide the first two years of college. The State apportionment per FTE within the CSU system is $4026 (see Table 19). The State apportionment per ADA at Long Beach City College averaged $1584 ($25,171,609/15891 ADA). Assuming that 25 percent of the 3200 transfer ADA were eligible to attend CSULB upon graduation from high school, the State saves almost $2 million per year ($2450 x 800 ADA). The saving would be greater if students in their first two years at California State Universities were to enroll in a community college.

Parenthetically, an irony emerges from this situation because fee increases in the University of California and the California State Universities system generally increase the price and lower the demand for lower division undergraduate education at these institutions. In the absence of fees at the community college, the demand for lower division undergraduate education increases. But the community college is caught between the rock of Prop. 13 and the hard place of legislative funding cuts. To impose fees for community college enrollment will only reduce the demand among poverty level families. If there is a greater incentive to remain in poverty than to obtain an education (or work), the State is merely asking to make the continuous series of $7000 payments. Catch 22.

TABLE 20
AVERAGE COST PER ADA, LBCCD
FISCAL 1981

Total 1980/81 Expenditure	$ 38,270,481
Less: Actual Capital Outlay (Fund 8)	988,186
Current Expenditure	37,082,295
ADA	15,891
Cost per ADA	2,339

SOURCE: Long Beach Community College District. 1981-1982 Budget, p 4.

(4) The implications of the results of work by M. Harvey Brenner, Johns Hopkins School of Hygiene & Public Health suggest that reduced unemployment brings about significant social benefits. Business Week (29 March 1982, page 166) describes these results as follows:

> "When unemployment rises by 1 percent, state prison populations rise by 4 percent, murders increase by 5.7 percent, mental hospital admissions rise by 2 percent to 4 percent, and suicides increase by 4 percent."

Would these same relationships apply to the reduction in unemployment among high school graduates who receive one to three years of college education?

(5) The saving in unemployment compensation inherent in the significant drop in unemployment when the educational level is increased by one to three years of college.

(6) Private non-monetary rewards which have economic value.

APPENDIX I

ESTIMATED HOUSEHOLD PERSONAL INCOME AND RETAIL SALES TO PERSONAL INCOME RATIO, LONG BEACH COMMUNITY COLLEGE DISTRICT, 1980

ESTIMATION, PERSONAL INCOME, PER HOUSEHOLD

Estimation of the personal income per household within the College District at December 31, 1980 was accomplished by a three-step process which estimated

I. The ratio of per capita personal income to per capita Effective Buying Income;
II. The personal income of all households in Lakewood and Long Beach; and
III. The personal income per household within LBCCD.

I. Ratio of per capita personal income to Effective Buying Income, Los Angeles County, 1979.

Effective Buying Income (EBI) as used by "Sales and Marketing Management" magazine is personal income minus personal taxes and non-tax payments. Non-tax payments include social security taxes, fines, fees and penalties.

$$\frac{\text{1979 per capita income, LA County}}{\text{1979 per capita EBI, LA County}} = \frac{\$10,606}{\$\ 8,654} = 1.23$$

SOURCES: Per capita EBI, derived from "Sales and Marketing Management", Vol 125, #2 (July 28, 1980), p C-20. Per capita personal income, Security Pacific National Bank

II. Estimated household personal income, Lakewood and Long Beach, 1980.

	Long Beach	Lakewood
EBI (000's)	$3,031,198	$ 672,591
Number of households	153,900	24,800
Average EBI per household	$ 19,656	$ 27,120
times: ratio in I above	1.23	1.23
Estimated per household personal income	$ 24,177	$ 33,358
times: number of households	153,900	24,800
Estimated total household personal income (000's)	$3,720,840	$ 827,278

III. Personal Income per household, LBCCD, 1980.

Personal income, Long Beach (000's)	$3,720,840
Personal income, Lakewood (000's)	827,278
Total, personal income (000's)	$4,548,118
number of households	178,700
average personal income, LBCCD	$ 25,451

ESTIMATION RATIO RETAIL SALES TO PERSONAL INCOME

	Long Beach	Lakewood
Estimated retail sales (000's)*	$1,513,527	$ 270,032
divided by number of households	153,900	24,800
Retail sales per household	$ 9,834	$ 10,688
divided by personal income per household	24,177	33,358
Ratio retail sales to personal income	.407	.32

$$\frac{\text{retail sales, LBCCD}}{\text{Personal income, LBCCD}} = \frac{\$1,783,559,000}{\$4,548,118,000} = .392$$

* As reported in "Sales and Marketing Management," Vol 127, #2 (July 27, 1981), p C-22.

APPENDIX II

DATA USED TO PROJECT RETAIL SALES

TABLE IIA

RETAIL SALES, ESTABLISHMENTS, EMPLOYEES
CALIFORNIA, 1977

KIND OF ESTABLISHMENT	SALES (000's)	NUMBER OF ESTABLISH-MENTS	NUMBER OF EMPLOYEES WEEK OF 3-12-77
All Retailers	$78,721,406	130,125	1,393,244
Food Stores	$16,843,907	15,369	186,277
Food Away From Home	7,832,136	33,875	443,162
Drugs and Proprietary	3,029,218	4,107	48,796
Apparel and Accessories	3,655,338	11,769	81,058
Home Furnishings	4,125,129	9,952	58,419
General Merchandise	10,526,480	2,488	201,687
Building Materials, Hardware, Garden	4,216,149	5,319	48,027
Automotive	16,007,166	8,879	119,061
Gasoline	5,606,882	13,105	64,912
Miscellaneous	6,879,001	25,262	141,845

SOURCE: State of California. California Statistical Abstract 1980. Sacramento. 1980. Table L-4.

TABLE IIB

SALES AND EMPLOYEES PER ESTABLISHMENT
CALIFORNIA, 1977

KIND OF ESTABLISHMENT	SALES PER ESTABLISHMENT	EMPLOYEES PER ESTABLISHMENT
All Retailing	$ 604,000	10.7
Food Stores	1,096,000	12.1
Food Away From Home	231,207	13.1
Drug & Proprietary	737,574	11.9
Apparel & Accessory	310,590	6.9
Home Furnishings	414,502	5.9
General Merchandise	4,230,000	81.1
Bldg Mater., Hardware	792,658	9.0
Automotive	1,802,810	13.4
Gasoline	427,643	5.0
Miscellaneous	272,306	5.6

NOTE: Computed by dividing the retail sales in Table IIA by the number of establishments and by the number of employees during the week containing 12 March.

TABLE IIC

1977 RETAIL SALES PER ESTABLISHMENT IN 1981 DOLLARS

KIND OF ESTABLISHMENT	PRICE INDEX	SALES PER ESTABLISHMENT
All Retailing	140.7	$ 849,828
Food Stores	134.3	1,471,928
Food Away From Home	127.7	295,251
Drug and Proprietary	127.7	941,882
Apparel and Accessories	117.9	765,878
Home Furnishings	127.7	525,319
General Merchandise	127.7	5,401,710
Building Materials, etc.	127.7	1,012,224
Automotive	144.0	2,302,188
Gasoline	175.0	748,375
Miscellaneous	127.7	347,735

NOTE: Except for gasoline and automobiles, the price indices are the December 1980 index for Western Class A cities (December 1977=100). When a specific index value was not known, the value of the general merchandise component, 127.7, was used. In the case of gasoline and automobiles, individual values were not reported so the U.S. value was substituted.

APPENDIX III

COMPUTATION OF ESTIMATED VALUE OF COMMUNITY COLLEGE EDUCATION LOS ANGELES-LONG BEACH SMSA 1969 AND 1981

COMPUTATION OF AVERAGE DOLLAR INCREASE IN MEAN INCOME ALL PERSONS 25 AND OVER, LOS ANGELES-LONG BEACH SMSA

HIGH SCHOOL GRADUATES

AVERAGE INCOME, MEN HIGH SCHOOL GRADUATES, 25 AND OVER

(1)	# Men HS Grad	x	Av Income	=	Total Income
	565,598		$8430	$	5,535,121,140
(2)	# Men 18-24	x	Av Income	=	Total Income
	134,390		$3872	$	520,358,080
(3)	# Men HS Grad Over 24				522,208
(4)	Total Income HS Grad Over 24			$	5,014,763,060
(5)	Av Income Male HS Grad Over 24			$	9,603

AVERAGE INCOME, WOMEN HIGH SCHOOL GRADUATES, 25 AND OVER

(1)	# Women HS Grad	x	Av Income	=	Total Income
	671,870		$4059	$	2,727,120,330
(2)	# Women 18-24	x	Av Income	=	Total Income
	151,010		$2930	$	442,459,300
(3)	# Women HS Grad Over 24				520,860
(4)	Total Income HS Grad Over 24			$	2,284,661,030
(5)	Av Income Women HS Grad Over 24			$	4,386

WEIGHTED AVERAGE, MEAN INCOME, ALL HS GRADS OVER 24

Number of Male HS Grad Over 24		552,208
Number of Women HS Grad Over 24		520,860
Total		1,043,068
Av Income Men HS Grad Over 24	$	9,630
x Number Male HS Grad Over 24		522,208
Total Income	$	5,014,763,060
Av Income Women HS Grad Over 24	$	4,386
x Number Women HS Grad Over 24		520,860
Total Income	$	2,284,661,030

Total Income Men Plus Total Income Women	=	Total All Person
$ 5,014,763,060 + $ 2,284,661,030	=	$ 7,299,424,090
Total HS Grad Over 24 Men Plus Women		1,043,068

AV INCOME ALL HS GRAD OVER 24 = $ 6998

1 TO 3 YEARS COLLEGE

AVERAGE INCOME, MEN WITH 1 TO 3 YEARS COLLEGE, 25 AND OVER

(1)	# Men 1-3 Yr College	x	Av Income	=	Total Income
	428,850	x	$9301	$	3,988,733,850
(2)	# Men 18-24 W 1-3 Coll	x	Av Income	=	Total Income
	102,507	x	$3526	$	361,439,682
(3)	# Men W 1-3 Yr Coll Over 24				326,343
(4)	Total Income Men W 1-3 Yr Coll, Over 24			$	3,627,294,168
(5)	Av Income Men W 1-3 Yr Coll, Over 24			$	11,115

AVERAGE INCOME, WOMEN WITH 1 TO 3 YRS COLLEGE, 25 AND OVER

(1)	# Women 1-3 Yr College	x	Av Income	=	Total Income
	328,897	x	$3887	$	1,278,422,639
(2)	# Women 18-24 W 1-3 Yr Coll	x	Av Income	=	Total Income
	95,198	x	$2924	$	278,358,952
(3)	# Women W 1-3 Yr Coll, over 24				233,699
(4)	Total Income Women W 1-3 Coll, Over 24			$	1,000,063,687
(5)	Av Income, Women W 1-3 Yr Coll, Over 24			$	4,279

WEIGHTED AVERAGE, MEAN INCOME, ALL PERSONS OVER 24, 1 TO 3 YRS COLLEGE

Number of Males Over 24, 1-3 Yrs College		326,343
Number of Women Over 24, 1-3 Yrs College		233,699
Total		560,024
Av Income, Men Over 24, 1-3 Yrs College	$	11,115
x Number Men Over 24, 1-3 Yrs College		326,343
Total Income	$	3,627,294,168
Av Income, Women Over 24, 1-3 Yrs College	$	4,279
x Number Women Over 24, 1-3 Yrs College		233,699
Total Income	$	1,000,063,687

Total Income Men and Women Over 24, 1-3 Yrs College
$3,627,294,168 + $1,000,063,687 = $ 4,627,357,855
Total Men and Women, Over 24, 1-3 Yrs College 560,024

AV INCOME MEN & WOMEN OVER 24, 1-3 YRS COLLEGE = $8263

COMPUTATION OF INCOME DIFFERENTIAL ATTRIBUTABLE TO 1 TO 3 YEARS COLLEGE

Weighted Av Income, All Persons Over 24, With 1 to 3 Yr College	$ 8,263
Less: Weighted Av Income, All Persons Over 24, High School Grads	6,998
Gain From 1 to 3 Yrs College	$ 1,265

INCOME DIFFERENTIAL IN 1981 DOLLARS

Gain From 1 to 3 Years College in 1969 Dollars	$ 1,265
x Consumer Price Index for 1981 (see below)	238.5
Gain From 1 to 3 Years College in 1981 Dollars	$ 3,017

NOTE ON REBASING CONSUMER PRICE INDEX

1981 CPI Los Angeles-Long Beach (7/80-7/81)	259.4
1969 CPI Los Angeles-Long Beach	108.8
1981 CPI Los Angeles-Long Beach: Rebased (1969=100)	238.5

ALTERNATIVE INDEXING BASED ON AVERAGE WEEKLY EARNINGS IS NON-AGRICULTURAL WORKERS

July 1981 Average Weekly Earnings, Non-AG Workers	$ 257.74
1969 Average Weekly Earnings, Non-AG Workers	114.61
Index Average Weekly Earnings, Non-AG Workers (1969=100)	224.9
Gain From 1 to 3 Yrs College in 1969 Dollars	$ 1265
x Index Av Wkly Earn, Non-AG Workers (1969=100)	224.9
Gain From 1 to 3 Yrs College in 1981 Dollars	$ 2845

APPENDIX IV

COMPUTATION OF ESTIMATED VALUE
OF COMMUNITY COLLEGE EDUCATION
CALIFORNIA URBAN AREAS
1969 AND 1981

MEAN INCOME OF PERSONS 18 AND OVER
CALIFORNIA URBAN SMSA'S, BY AGE AND
YEARS OF SCHOOL COMPLETED, 1970 CENSUS

	YEARS OF SCHOOL COMPLETED		INCREASE FROM EXTRA SCHOOLING	
	4 YRS HI SCH	1-3 YR COL	$	%
Men				
18 and Over	$ 8166	$ 8771	$ 605	7.40
18 to 24	3644	3358	-286	-8.51
25 to 34	8455	8903	448	5.30
35 to 44	10211	11772	1561	15.29
45 to 54	11071	13248	2177	19.66
55 to 64	10216	12145	1929	18.88
65 & Over	6043	7495	1452	24.03
Women				
18 and Over	3882	4203	321	8.27
18 to 24	2728	2697	- 31	-1.15
25 to 34	3957	4634	856	17.11
35 to 44	4413	4915	502	11.38
45 to 54	4820	5535	715	14.83
55 to 64	4629	5509	880	19.01
65 & Over	3153	3884	731	23.18

SOURCE: U.S. Brueau of Census, 1970 Census: Detailed Characteristics: California, Table 197.

COMPUTATION OF AVERAGE DOLLAR INCREASE IN MEAN INCOME
ALL PERSONS 25 AND OVER, CALIFORNIA URBAN AREAS

HIGH SCHOOL GRADUATES

AVERAGE INCOME, MEN HIGH SCHOOL GRADUATES, 25 AND OVER

(1)	# Men HS Grad	x	Av Income	=	Total Income
	1,745,185		$8166		$ 14,251,118,071
(2)	# Men 18-24	x	Av Income	=	Total Income
	414,788		$3644		$ 1,511,487,472
(3)	# Men HS Grad OVer 24				1,330,397
(4)	Total Income HS Grad OVer 24				$ 12,739,693,238
(5)	Av Income Male HS Grad Over 24				$ 9,576

AVERAGE INCOME, WOMEN HIGH SCHOOL GRADUATES, 25 AND OVER

(1)	# Women HS Grad	x	Av Income	=	Total Income
	1,648,641		$3882		$ 6,400,024,362
(2)	# Women 18-24	x	Av Income	=	Total Income
	383,003		$2728		$ 1,044,832,184
(3)	# Women HS Grad OVer 24				1,265,638
(4)	Total Income HS Grad OVer 24				$ 5,355,192,178
(5)	Av Income Women HS Grad OVer 24				$ 4,231

WEIGHTED AVERAGE, MEAN INCOME, ALL HS GRADS OVER 24

Number of Male HS Grad Over 24		1,330,397
Number of Women HS Grad OVer 24		1,265,638
Total		2,596,035
Av Income Men HS Grad Over 24	$	9,576
x Number Male HS Grad Over 24		1,330,397
Total Income	$	12,739,693,238
Av Income Women HS Grad Over 24	$	4,231
x Number Women HS Grad Over 24		1,265,638
Total Income	$	5,355,192,178

Total Income Men Plus Total Income Women	=	Total All Person
$12,739,693,238 + $5,355,192,178	=	$ 18,094,885,416
Total HS Grad Over 24 MEN PLUS WOMEN		2,596,035

AV INCOME ALL HS GRAD OVER 24 = $6970

1 TO 3 YEARS COLLEGE

AVERAGE INCOME, MEN WITH 1 TO 3 YEARS COLLEGE, 25 AND OVER

(1)	# Men 1-3 Yr College	x	Av Income	=	Total Income
	1,113,050	x	$8771		$ 9,762,561,550
(2)	# Men 18-24 W 1-3 Coll	x	Av Income	=	Total Income
	303,340	x	$3358		$ 1,018,615,720
(3)	# Men W 1-3 Yr Coll, Over 24				809,710
(4)	Total Income Men w 1-3 Coll, Over 24				$ 8,743,945,830
(5)	Av Income Men, 1-3 Yr Coll, Over 24				$ 10,799

AVERAGE INCOME, WOMEN WITH 1 TO 3 YRS COLLEGE, 25 AND OVER

(1)	# Women 1-3 Yr College	x	Av Income	=	Total Income
	837,636	x	$4203		$ 3,520,584,108
(2)	# Women 18-24 W 1-3 Coll	x	Av Income	=	Total Income
	262,460	x	$2697		$ 707,854,620
(3)	# Women W 1-3 Yr Coll, Over 24				575,176
(4)	Total Income Women W 1-3 Coll, Over 24				$ 2,812,729,488
(5)	Av Income, Women, 1-3 Yr Coll, Over 24				$ 4,890

WEIGHTED AVERAGE, MEAN INCOME, ALL PERSONS OVER 24, 1 TO 3 YRS COLLEGE

Number of Males Over 24, 1-3 Yrs College		809,710
Number of Women Over 24, 1-3 Yrs College		575,106
Total		1,384,816
Av Income, Men OVer 24, 1-3 Yr College	$	10,799
x Number Men Over 24, 1-3 Yr College		809,710
Total Income	$	8,743,945,830
Av Income, Women Over 24, 1-3 Yr College	$	4,890
x Number Women Over 24, 1-3 Yr College		575,176
Total Income	$	2,812,729,488

Total Income Men and Women Over 24, 1-3 Yrs College
$8,743,945,830 + $2,812,729,488 = $11,556,675,320
Total Men and Women, Over 24, 1-3 Yrs College 1,484,886

AV INCOME MEN & WOMEN OVER 24, 1-3 YR COLLEGE = $7783

COMPUTATION OF INCOME DIFFERENTIAL ATTRIBUTABLE TO 1 TO 3 YEARS COLLEGE

Weighted Av Income, All Persons Over 24, With 1 to 3 Yr College	$ 7783
Less: Weighted Av Income, All Persons Over 24, High School Grads	6970
Gain From 1 to 3 Yrs College	$ 813

INCOME DIFFERENTIAL IN 1981 DOLLARS

Gain From 1 to 3 Years College in 1969 Dollars	$ 813
x Consumer Price Index for 1981 (see below)	238.5
Gain From 1 to 3 Years College in 1981 Dollars	$ 1939

NOTE ON REBASING CONSUMER PRICE INDEX

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ALTERNATIVE INDEXING BASED ON AVERAGE WEEKLY EARNINGS OF NON-AGRIBULTURAL WORKERS

July 1981 Average Weekly Earnings, Non-AG Workers	$ 257.74
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Index Average Weekly Earnings, Non-AG Workers (1969=100)	224.9
Gain From 1 to 3 Yrs College in 1969 Dollars	$ 813
x Index Av Wkly Earn, Non-AG Workers (1969=100)	224.9
Gain From 1 to 3 Years College in 1981 Dollars	$ 1828

APPENDIX V

BUDGETS, LOWER, INTERMEDIATE, HIGH CATEGORIES
LOS ANGELES-LONG BEACH SMSA, AUTUMN 1979

ANNUAL BUDGET FOR A FOUR PERSON FAMILY
LOS ANGELES-LONG BEACH, AUTUMN 1979

	BUDGET CATEGORY		
	LOWER	INTER-MEDIATE	HIGH
Total Budget	$ 13399	$ 19871	$ 30083
Less: Personal Taxes	958	2641	6101
Soc Sec & Disabil	844	1243	1427
Insurance, Gifts	563	869	1478
Total Consumption	11034	15118	21077
Food at Home	3290	3984	4826
Food Away	610	919	1616
Housing*	2289	3238	4789
Home Furnishings	577	984	1846
Transportation Total	1077	1948	2566
Clothing	865	1189	1701
Personal Care	317	420	596
Medical Care	1491	1493	1562
Other	518	943	1579

* Housing assumes all lower budget families are renters, intermediate families are 25 percent renters and 75 percent homeowners, high budget families are homeowners.

SOURCE: U.S. Department of Labor, Bureau of Labor Statistics. "Handbook of Labor Statistics," December 1980, Tables 150, 151, 152.

RETAIL SALES AS PERCENT OF TOTAL BUDGET

	BUDGET CATEGORY		
	LOWER	INTER-MEDIATE	HIGH
Total Consumption	$ 11034	$ 15118	$ 21077
Less: Housing	2289	3238	4789
Medical Care	1491	1493	1562
Net= Retail Purchases	7254	10387	14726
Retail Purchases as a Percent of Budget	54.1%	52.3%	49.0%

APPENDIX VI

PRESENT VALUE FACTORS
SELECTED INTEREST RATES

YEARS	RATE OF INTEREST					
	5%	10%	18%	20%	30%	40%
1	.9524	.9091	.8475	.8333	.7692	.7143
2	1.8594	1.7355	1.5656	1.5278	1.3609	1.1111
3	2.7232	2.4869	2.1743	2.1065	1.8161	1.4074
4	3.5460	3.1699	2.6901	2.5887	2.1662	1.6049
5	4.3295	3.7908	3.1272	2.9906	2.4356	1.7366
10	7.7217	6.1446	4.4941	4.1925	3.0915	1.9653
15	10.368	7.5902	5.0853	4.6706	3.2662	1.9949
20	12.462	8.5136	5.3527	4.8696	3.3158	1.9994
30	15.372	9.4269	5.5168	4.9789	3.3321	2.0000
35	16.374	9.6442	5.5386	4.9915	3.3330	2.0000

SOURCE: Kemeny, John G. Finite Mathematics with Business Applications. Englewood Cliffs, NJ: Prentice-Hall, Inc., 1962. Appendix IV.

DO-IT-YOURSELF PRESENT VALUE

(1)	Define the size of the stream of future payments or the stream of cost savings	$ 7000
(2)	Determine the number of years over which that payment or saving will occur. Probably normal retirement age minus age of student upon leaving LBCC	10 yrs
(3)	Determine the rate of interest	18%
(4)	From the table above locate the factor for an 18 percent interest rate and 10 years	4.4941
(5)	Compute (1) x (4) = present value	$ 31458.7

Answer the following question

How much would you pay out today to get a stream of $7000 annual payments for the next 10 years? Answer: $31458

NOTE: The $7000 received each year is in part interest and in part a return of principal. During year 1 about $5700 would be interest @ 18 percent on the initial $31458 and about $1300 would be a return of principal. In year 10 almost all of the $7000 would be a return of principal and only a small portion would be interest.

APPENDIX VII

COMPARISON OF LONG BEACH COMMUNITY COLLEGE DISTRICT WITH ILLINOIS COMMUNITY COLLEGES

For comparative purposes, the table below compares selected ratios for LBCCD with those developed in the Illinois Community College Study. The use of ratios makes possible the comparison of 1978 Illinois data with 1981 LBCCD data. Ratios I and II for LBCCD seem too low when compared to the Illinois results. The difference may be traced to the fact that the LBCCD business volume does not include any visitors nor does it include student expenditures which are assumed to be zero. In the case of student expenditures, it is assumed that the marginal impact of students is zero since they still live in the District and spend their money on other goods independently of their enrollment in LBCC.

SELECTED RATIOS LBCCD AND ILLINOIS COMMUNITY COLLEGES, CAFFREY AND ISSACS METHODOLOGY

RATIO CODE	LBCCD	ILLINOIS COMMUNITY COLLEGES						
		AV	A	B	C	D	E	F
I	.78	3.16	2.76	2.88	2.63	3.45	3.41	3.85
II	.94	1.55	1.49	1.15	1.39	1.68	1.73	1.86
III	11.54	3.41	2.30	2.36	2.46	2.32	7.34	3.66
IV	9.62	6.93	4.28	5.91	4.63	4.76	14.43	7.59
V	.07	.53	.61	.53	.61	.66	.25	.54

RATIO CODES

I	Business Volume (B-1) to College Expenditures
II	Personal Income (I-2) to College Expenditures
III	Personal Income (I-2) to Local Revenue
IV	Business Volume (B-1) to Local Revenue
V	Local Revenue to Total College Revenue

NOTE: Average ratio value for the Illinois Community Colleges computed as an unweighted average of the ratios for each individual college.

SOURCE: LBCCD: B-1 and I-2 see this section above.
LBCCD: Total Income ($35.9 million)
Local Revenue excluding interest income and nonresident student fees ($2.6 million) and Total General Fund Expenditure accounts 1000-5000 ($32.0 million), excluding capital outlay, student financial aid, and contingency.
Long Beach Community College District "Budget, 1982-83."
Illinois: Illinois Community College Board, "A Study of the Economic Impact of Six Community Colleges in Illinois." March 1980. p 16.

APPENDIX VIII

THE VIEW FROM THE COLLEGE: A DIGRESSION ON THE FUTURE ECONOMIC IMPACT OF LBCC

DEMOGRAPHIC CHANGES AND POVERTY IN LONG BEACH

Demographic changes within the District should increase the significance of LBCCD in eliminating poverty and maintaining the economic health of the local economy.

The ethnic composition of the local community has been changing dramatically since the 1970 Census. The data in Table VIII.A reflects this change. The continuation and strengthening of this trend is reflected in the enrollment trend of the Long Beach Unified School District whose boundaries are coterminous with those of the LBCCD. This trend is summarized in Table VIII.B.

TABLE VIII.A
ETHIC COMPOSITION, CITY OF LONG BEACH
1960-1970-1976

ETHNIC GROUP	1960	1970	1976
White	93.4%	84.5%	73.9%
Black	2.8%	5.3%	9.4%
Hispanic	2.3%	7.3%	11.7%
Other	1.5%	2.9%	5.0%

SOURCE: Long Beach Department of Planning and Building, Statistical Abstract of Long Beach: 1960-1970-1976. October 1978, p 23.

TABLE VIII.B
SCHOOL ENROLLMENT, BY ETHNIC BACKGROUND
LONG BEACH UNIFIED SCHOOL DISTRICT
FALL 1978

ETHNIC GROUP	ELEMENTARY	JUNIOR HI	SENIOR HI
White	58.5%	61.7%	65.5%
Black	17.4%	19.0%	17.0%
Hispanic	17.0%	13.3%	10.5%
Other	7.1%	6.0%	7.0%

SOURCE: Long Beach Community College District. Fifth Year Validation Self Study. October 1979. pp I-3, I-4

The trend in LBUSD enrollments suggests that Long Beach is becoming more like the City of Los Angeles. At the time of the 1970 Census, the Hispanic and Black ethnic groups each made up 17 percent of the families in Los Angeles. Referring back to Table 17, it may be observed that one to three years of college reduces the incidence of poverty among Black families from 20.6 per hundred to 10.9 per hundred. A similar but less dramatic result can be seen for Hispanics.

Two important contributions can be expected from LBCC in the future assuming that funding is not substantially reduced in real terms. First, the reduction in the number of poverty families has important implications for public assistance expenditures. The discussion in the section on unquantified impacts is relevant in this context.

The second important contribution will be to maintain personal incomes, jobs and the level of retail sales at levels that existed before the change in ethnic composition of the District. Using data from "Sales and Marketing Management" magazine, the Long Beach Department of Planning and Building drew the following conclusion in the "Statistical Abstract of Long Beach 1960-1970-1976:"

> "Although the Long Beach city-wide income increased in proportion to the County from 1960 to 1970, it shows an effective buying income of only $12,318 for 1976, a marked decrease in relation to the County's whose EBI was $14,184 for 1976."

The relative decline in effective buying power for Long Beach is probably related to the impact of increased unemployment and poverty which accompanies the changing ethnic composition of the community.

While it is unreasonable to expect LBCC to single handedly eliminate the negative impact of ethnic changes, the rate of return for Blacks with one to three years of college is higher than the rate of return for similar Whites. Tables VIII.C and VIII.D contain results of studies which verify this conclusion.

TABLE VIII.C
ESTIMATES OF SOCIAL RATE OR RETURN
FROM INCREASED SCHOOL EXPENDITURE

	MAXIMUM ESTIMATE		MINIMUM ESTIMATE	
	HOURLY EARNING	ANNUAL EARNING	HOURLY EARNING	ANNUAL EARNING
White				
Total	14%	14%	9%	10%
Direct	15	14	9	10
Black				
Total	15	18	13	13
Direct	18	20	17	19

NOTES: Direct rate of return is greater than total because total is reduced by forgone earnings.
SOURCE: Akin, John S. and Garfinkel, Irwin. "School Expenditures and the Economic Returns to Schooling", Journal of Human Resources, XII, No. 4, p 460.

TABLE VIII.D
RATE OF RETURN FOR WHITE AND BLACK WORKERS
BY EDUCATIONAL LEVEL AND WORK EXPERIENCE

WORK EXPERIENCE	RATE OF RETURN	
	1 TO 4 YR HI SCH	1 OR MORE COLLEGE
White		
Fewer than 6	.193%	.098%
6 to 10	.124	.074
11 to 15	.126	.068
16 to 20	.112	.078
21 to 30	.073	.072
31 or more	.041	.060
Black		
Fewer than 6	.207	.116
6 to 10	.111	.097
11 to 15	.084	.144
16 to 20	.133	.081
21 to 30	.062	.074
31 or more	.090	.089

SOURCE: U.S. Department of Labor, "Monthly Labor Review," April 1981, p 32.

ERIC Clearinghouse for Junior Colleges
8118 Math-Sciences Building
University of California
Los Angeles, California 90024
APR 13 1983